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# The Influence of Ownership Structure on ESG Ratings

**Authors***
Sarah Adelfang & Alexander Staneker

**Supervisor**
Michael Halling

──────────────── **Abstract** ────────────────

The increasing trend towards sustainability within the investment community has motivated this paper to investigate the relationship between ownership structure and ESG rating score. Using data from 735 companies between 2009 and 2018, this paper applies a *fixed effects regression* to evaluate the influence of ownership type and ownership concentration on the ESG score. The results indicate that the various classes of investors holding shares in a company do have an influence on the level of the ESG score. In particular, it has been found that state ownership does affect the ESG score in a positive way, whereas ownership of institutional investors, corporations and individuals exhibits a negative influence on ESG. Moreover, our analysis suggests that with increasing ownership concentration the ESG score experiences a larger negative impact.

*Keywords: ESG, CSR, Ownership, Sustainability, Concentration*

*Author contact information:
Sarah Adelfang, 41476@student.hhs.se
Alexander Staneker, 41466@student.hhs.se

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## 1. Introduction

*"Sustainable investing will be a core component for how everyone invests in the future. We are only at the early stages."*

- Larry Fink, BlackRock Inc. chairman and chief executive (Financial Times, 2018)

With climate change, environmental disasters, and social instabilities, the world is facing major challenges today. The leading opinion in the international community is that actions must be taken to prevent more devastating consequences to the extent possible. Major initiatives aiming to combat these developments are drawing the attention of the world's population. One of the most popular initiatives are the *Sustainable Development Goals* of the United Nations, published in 2015. These are intended to ensure that economic growth is reconciled with environmental protection and social needs (United Nations, 2019). The positive trend can also be observed in the business environment, where the number of companies promoting corporate social responsibility (CSR) has increased considerably (European Commission, 2001). According to the latest UN Global Compact study, 75% of the respondents declared that they incorporate the *Sustainable Development Goals* into their decision making (United Nations Global Compact, 2017).

Nevertheless, concerning financial liquidity, these international companies are highly dependent on the global capital market. Investors exert pressure on companies to report their commitment on sustainability issues (United Nations Global Compact, 2014) and require meaningful sources to evaluate this commitment. The ESG score represents such a source of information. It provides a comprehensive source for a company's environmental, social, and governance (ESG) rating, which includes performance, commitment, and effectiveness. The score can reach values between 0 and 100. A higher ESG score, *ceteris paribus*, is associated with a higher commitment to sustainability issues of a company (Refinitv, 2019). In order to help investors evaluating the information, major initiatives have appeared in the marketplace such as the Principles of Responsible Investment (PRI) which were initiated as independent advice for investors on how to address ESG factors (PRI, 2019a). Although these trends exist, it is of great relevance for companies and policy makers to determine whether investors are truly interested in participating in the wave of sustainability.

The purpose of this thesis is therefore to examine the world of investors and their respective approach towards sustainability in more detail. It seeks to determine whether the orientation

towards sustainability is reflected in the preferences and actions of investors. Has the trend indeed already made its way into the financial world, in which profit by definition is the first priority? Or is its prevalence not as popular as the hype mentioned in the beginning seems to indicate? As investor types vary in their characteristics and strategic goals, we aim to investigate whether and in which direction each type exerts influence on a company's ESG engagement, in particular of those companies included in the *S&P 500*. We assess whether ownership structure, which is defined by the type of investors holding shares and the percentage each type holds (from now on called concentration), influences the level of the ESG score. Consequently, the following research question guides the analysis and critical evaluation presented in this paper:

*"What influence does the ownership structure have on the ESG score?"*

This paper investigates two relationships of interest: (1) the influence of ownership type and (2) the influence of ownership concentration on the level of ESG score. When assessing the first relationship, the focus of the analysis is on six distinct investor classes: state, institutional investors, individuals, banks, corporations, and pension funds. The relationship is explored by applying a *fixed effects model,* which was chosen because it controls for effects which are constant (Wooldridge, 2012) - for example, ones occurring because the company is operating in a specific industry, or ones related to specific years (e.g., due to economic trends). The impact direction of investors in our results is either (i) positive, (ii) negative, or (iii) neutral. Our analysis indicated that indeed most of the investors (institutional investors, corporations and individuals) exhibit a negative influence on ESG (ii), while only one investor class (namely, the state) appears to have a positive impact on ESG (i). Regarding banks and pension funds, we found neutral results (iii).

Secondly, the impact of ownership concentration is investigated. Specifically, we examined the influence of ownership concentration on ESG rating by applying another *fixed effects model* with the *Herfindahl-Hirschman Index (HHI)* as a measure of concentration. The *HHI* is an important indicator for market concentration, which is widely used in academia and practice (Rhoades, 1993). The results suggested that with increasing ownership concentration, the ESG score is negatively influenced. Building on our initial analysis, our empirical results were furthermore tested through a set of robustness checks, which provided evidence for the statistical validity of our findings.

This paper adds a relevant contribution to the existing body of research on ESG. While the financial performance ESG link has been already thoroughly researched (e.g., Eccles et al., 2014; Orlitzky et al., 2003; Surroca et al., 2010), the link between ESG and ownership has not drawn the same attention so far. Most studies focus on one or two particular types of owners only (e.g., Erhemjamtsa & Huang, 2019; Lopatta et al., 2017) or do not focus specifically on ESG but rather on CSR (e.g., Dam & Scholtens, 2012), which is often used synonymously but still includes some differences. Our findings have important economic implications, as they provide proof that although awareness and initiatives have increased, the sustainability focus is not yet at the top of priority of most investors today. Rather, we found that most of the investor classes exhibit a negative influence on ESG.

The remainder of this paper is organized as follows: first, in chapter 2 relevant previous literature and research are aggregated and summarized to provide a thorough theoretical background for the subsequent empirical analysis. Chapter 3 builds upon these findings and explains our research question and hypotheses. In chapter 4 the methodology and data collection applied to answer this research question are presented. Chapter 5 then discusses and evaluates our empirical findings. Chapter 6 outlines the robustness checks applied to these results to test the validity, while chapter 7 introduces some potential limitations of this study. The paper closes in chapter 8 by offering a final conclusion.

## 2. Background

This chapter provides the theoretical background for the hypotheses derived in chapter 3. First the developments towards sustainability are analyzed, both in general and more specifically in the financial market. Afterwards, an overview of the different types of investors is provided as well as their specific characteristics are discussed.

### 2.1 Trend towards Sustainability

A few decades ago, a new trend started off, and scientists began to investigate the scope of corporate responsibility beyond the mere desire for profit maximization. One of the first publications regarding this topic was *Social Responsibilities of the Businessman* by Howard R. Bowen in 1953, which addressed the obligation to incorporate business ethics and social responsibility in the decision-making process. Since then, there has been a substantial development in the area of social responsibility, with one of the biggest initiatives being the 17 *Sustainable Development Goals* of the Sustainable Development Agenda 2030 initiated by the United Nations in 2015. Signed by the world leaders, these goals are intended to ensure a sustainable development at the economic, ecological, and social levels (United Nations, 2019). Furthermore, with the UN Global Compact, a worldwide contract was developed between the UN and over 13,000 companies becoming the world's largest corporate sustainability initiative to date (United Nations Global Compact, 2014). It lays out 10 principles for a sustainable and inclusive world economy for the benefit of people, communities, and markets, both today and in the future (Global Compact, 2019a). The principles are grouped into four areas: human rights, labor, environment, and anti-corruption (Global Compact, 2019b).

Within business, the awareness of social responsibility has become more prominent. Today, 93% of CEOs consider sustainability to be important for their future success (United Nations Global Compact, 2014). Nevertheless, the view on corporate social responsibility and its role differs with each company. As shown by Carroll (1999) when analyzing the range of definitions since 1950, there is no clear framework which is applied by everyone so far. Indeed, the range of definitions is wide. Dahlsrud (2006) conducted a literature review and tried to identify the different dimensions of CSR. He came up with five recurring ones: environmental, social, economic, stakeholder, and voluntariness. The analysis shows that with 97% probability at least three of these five dimensions are included in a random definition of CSR.

In 2019, the United Nations Industrial Development Organization (UNIDO) defined CSR as "*a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders. CSR is generally understood as being the way through which a company achieves a balance of economic, environmental and social imperatives ('Triple-Bottom-Line-Approach'), while at the same time addressing the expectations of shareholders and stakeholders.*"

## 2.2. Sustainable Investing

For most investors, profit maximization comes first (Halbritter & Dorfleitner, 2015). Traditional financial theory argues that companies should focus exclusively on maximizing shareholder value and have no further responsibility to act in the interests of stakeholders or society's welfare (Bénabou & Tirole, 2010; Friedman, 2007). According to the classic agency view, a commitment towards corporate social responsibility comes at the cost of financial performance, because resources are used for this purpose rather than for value-generating projects or shareholder payouts (Erhemjamtsa & Huang, 2019). On the contrary, Freeman (1984) argues that through effective stakeholder management, a firm can enhance its ability to achieve competitive advantage and long-term value creation; therefore, firms should invest in CSR. Within several studies the PRI (2015, 2016a, 2016b) even states that neglecting ESG issues in investment decisions is a breach of fiduciary obligations. Consequently, not only has sustainability become increasingly important within the management of companies, it is also of growing importance for investors.

Impact investing, socially responsible investing, ESG investing, sustainable investing: these terms all deal with the same objective - basing investment decisions not only on the performance of a company, but further including other ethical and responsible factors in the considerations. For investors it has always been difficult to make strategic resource allocation decisions and it has recently become even more so, as they are not only evaluated on financial performance anymore but also have to satisfy other expectations from society (Waddock & Graves, 1997). In recent years, it has become increasingly crucial for institutional investors to engage actively in ESG-related activities in their portfolio companies (Eurosif, 2013; Eurosif, 2016; Gifford, 2010). The market for sustainable investments has altered significantly. The number of US funds that incorporate ESG factors has risen from 55 in 1995 to 1,002 in 2016 (WRI, 2016). The first green bond was issued only slightly more than 10 years ago by the World Bank (World Bank, 2019). Rating agencies measuring the sustainability of companies appeared

on the financial marketplace only a few years ago, e.g., Sustainalytics in 1992 and Vigeo in 2002 (Sustainalytics, 2019; Vigeo Eiris, 2019). Approximately USD 30 trillion were invested in sustainable assets in 2018 (GSIR, 2018).

### *Investor Motivation*

But where does this new trend come from? What is the motivation for investors to care about responsible and sustainable actions on the part of their investment companies? Should they not care only about the financial performance and the resulting return of their portfolio companies? Is it just about philanthropy or does ESG bring other benefits to the investors?

As the PRI (2017) states, *SDGs* (*Sustainable Development Goals*) are an unavoidable consideration for universal owners. The PRI (2019a) provides three reasons why responsible investments have been growing. The first is materiality: there is an increasing awareness within the financial community that ESG factors have an influence on a company's risk and return. Through their investments in companies, universal portfolio owners are exposed to growing economic costs. For example, being invested in companies operating in socially disruptive or highly polluting activities and thereby facing high external costs might have long-term financial consequences for the investors, by lowering the asset value. Considering environmental engagement is important for investors, as the companies otherwise have to spend huge amounts on insurance premiums, taxes, and costs deriving from disasters. Furthermore, companies operating in countries with high poverty and inequality will face the risk of social and political disruptions, which could result in worse financial results (PRI, 2017). The second is market demand - investors seek for more transparency and information about what kind of companies their money is invested in. The third - investors are facing a higher pressure from regulators to view ESG as part of their fiduciary duty towards clients and beneficiaries (PRI, 2019a). Consequently, there is a number of incentives for investors to engage with environmental and social aspects in their investments.

Hartzmark and Sussman (2019) were able to prove that sustainability rankings of mutual funds are influencing their investors through a natural experiment. As mentioned, it has always been difficult to assess sustainability objectively. Therefore, receiving data on the sustainability performance of mutual funds has been rather difficult. However, in March 2016, a solution was found by the launch of Morningstar, which published rankings of 20,000 funds on a scale from one globe (worst) to five globes (best). Hartzmark and Sussmann (2019) show that after this

ranking was published, funds with low sustainability rankings experienced a net fund outflow of over USD 12 billion, whereas those having high scores received an inflow of over USD 24 billion. Within the timeframe of 11 months, the highest rating ones managed to receive investments equaling ~4% of their fund size. In contrast, mutual funds with a low number of globes lost ~6% of their fund size due to outflows. This pattern strongly indicates that investors are valuing and assessing sustainability ratings. Three potential motives were discussed in the paper: institutional investors are obliged to value sustainability due to constraints received from their institutions, they see sustainability as a signal for higher future returns, or they value sustainability based on non-financial motives as altruism. Although they find no evidence for better financial performance, the belief of investors in it as well as non-pecuniary motives seem to be the main motivations for the incorporation of ratings in investment decisions.

A vast amount of research investigates the question whether higher ESG scores are interconnected with higher performance (see e.g., McWilliams & Siegel, 2000; Orlitzky et al., 2003). Nevertheless, the scientists are not yet in agreement on the issue. Some argue for a positive relationship between financial performance and ESG (e.g., Eccles et al., 2014; Orlitzky et al., 2003), whereas others prove the existence of a negative relationship (e.g., Aupperle et al., 1985). Another group finds no significant connection at all (e.g., Surroca et al., 2010). Moreover, there is the question of causality. Are companies more successful because they invest heavily in ESG, or do successful companies have the financial resources to optimize their ESG performance? Waddock and Graves (1997) show that the relationship is indeed a virtuous cycle where social performance appears to be both a predictor and a consequence of financial performance. Irrespective of the fact that the research body has no clear conclusion on the subject, the new trend has evolved. ESG scores have found their way into the investment decisions of the largest and most sophisticated investors (Eccles et al., 2017).

What might be an additional reason for this shift is the fact that firms with good CSR transparency and performance face fewer capital constraints (Cheng et al., 2014), which allows them to operate in a less restricted way. It also has been shown that stock and bond prices of companies that commit themselves to CSR in the event of negative headlines benefit from insurance-like effects. However, this effect is only a one-time protection and does not provide long-term coverage against negative events. It quickly disappears when facing the second, third or subsequent negative event (Shiu & Yang, 2015). Nevertheless, it is also beneficial for investors, as the loss in connection with a negative event will turn out to be less harmful for

them. Reducing the downside risk arising from poor ESG performance is critical to the active engagement of investors in ESG. A company performing particularly poorly on ESG issues could imply severe financial, legal, reputational, and operational risks (Blackrock & Ceres, 2015).

Besides the factors mentioned, the companies themselves have additional benefits, which also might be advantageous for investors over time. Research has shown that companies with a better commitment to sustainability might have access to better resources (Cochran & Wood, 1984; Waddock & Graves, 1997). Additionally, it has been found that the prospects of attracting qualified employees are higher (Turban & Greening, 1997), the company's reputation is enhanced (Fombrun & Shanley, 1990; Fombrun, 2005; Freeman et al., 2007), and the risk of regulatory, legal, or tax measures can be mitigated (Freeman, 1984; Berman et al., 1999; Hillman & Keim, 2001). From a customer perspective, reasons to invest in sustainable funds might be the hope that these will outperform the market or the willingness to pay a premium, as these investors value sustainability (Hartzmark & Sussman, 2019). Both of these factors are favorable for the investors.

### *ESG Performance Measurement*

To be able to invest in sustainable assets, investors must have an information criterion which enables them to assess companies and their sustainability performance. Throughout the investor community a variety of strategies are applied for identifying sustainable companies in which to invest. The most popular one is negative screening, whereby companies or industries are eliminated that do not fit the requirements set up by the investor. In 2016, USD 15,023 billion of socially responsible strategies worldwide were invested based on this strategy. Second in popularity, representing USD 10,369 billion in 2016 was ESG integration, including ESG factors in the analysis. This strategy will be the main focus area of our thesis. Apart from that, a number of other tactics are available, including norm-based screening, best in class investment selection, impact investing, or sustainability themed investing (Eurosif, 2016; Global Sustainable Investment Alliance, 2017).

As mentioned, one of the most widely used sources is the ESG score, which stands for Environmental, Social and Governance. Several market players try to help investors by providing ESG scores, which help quantify the performance of the companies on these matters: On the one hand, the big commercial financial data providers including *Bloomberg, Thomson*

*Reuters,* and *MSCI; o*n the other hand, players focused only on delivering ESG data, such as *Sustainalytics* and *Vigeo Eiris*. As all of them have developed their own frameworks and factors they consider when grading companies, their ratings differ. These differences arise because it is highly complex to compare the performances of companies of various industries and sizes in terms of responsible behavior. Because the ratings greatly diverge, studies based on them also lead to differing results (Berg et al., 2019).

### *Major Initiatives*

The investment community is a powerful driver pushing companies to report on non-financial information, with big associations pressuring towards such as the Principles for Responsible Investment (PRI) or Sustainable Stock Exchange (SSE) initiatives (United Nations Global Compact, 2014). The PRI group, supported by the UN, is an investor initiative that serves as an independent supporter for those seeking to incorporate ESG factors into their investment and ownership decisions. So far, nearly 2,500 investment managers, service providers, and asset owners have signed an agreement including the six principles, which state (among other things) that they will incorporate ESG issues into their investment analysis and decision-making processes (PRI, 2019a; PRI, 2019b).

Another initiative from the UN Secretary General was the Sustainable Stock Exchange (SSE), which was set up in 2009 as a partnership program between the UN Conference on Trade and Development (UNCTAD), the UN Global Compact, the UN Environment Program Finance Initiative (UNEP FI), and the Principles for Responsible Investment (PRI). The SSE supports stock exchanges to encourage and promote sustainable investments. With this initiative they aim to make sustainable stocks more investable. So far, 90 out of 96 stock exchanges have joined the network by signing a voluntary commitment. The network consists of representatives of all capital market stakeholders such as stock exchanges, capital market regulators, and investors as well as companies. Through the support of SSE, 47 of these stock exchanges have already been able to offer a guide for issuers on how to report on ESG issues, and 24 even require ESG reporting as a listing rule (SSE, 2019). In recent years, these initiatives have made it much easier for investors to incorporate sustainability aspects into their decisions.

As shown in this section, sustainable investing is one of the most exciting financial topics of our time. It is therefore worth taking a closer look at how the world of investors deals with this topic and incorporates it into their decision-making, which we will do in the upcoming section.

## 2.3 Investor Types

In large public companies, ownership is primarily separated from management, which implies one of the dominant problems of organizations described by the agency theory. The agency theory holds a central role in the corporate governance literature and illustrates the fundamental discrepancy of interests in the relationship between the owners and the management of a firm, respectively the principals and the agents. Jensen and Meckling (1976) investigated this issue and indicated that related agency problems generate agency costs, which companies and their owners seek to reduce. A key element of their theory posits that it is relatively costly for outside shareholders to observe the management's actions. In addition, they analyzed the concentration of shares held by outside investors and found that large shareholders are better in monitoring the management than small shareholders, in terms of costs and efficiency, mainly because major shareholders have sufficient voting power to influence management decisions.

The financial market landscape encompasses various types of investors, with each of them having different demands and opinions about the companies in which they are invested. These conflicts of interests among the multiple shareholder types induce a challenge for managers, as they need to consider diverse interests. Therefore, top management prioritize their shareholders according to specific attributes such as power, legitimacy, and urgency (Agle et al., 1999). As a result, the investors' motivation to encourage companies towards higher sustainability standards differs, as well as their impact being limited to the relative power of each investor.

The extent to which the shareholders of a firm can exploit their interests is embedded in the framework of corporate governance. The latter is defined as *"the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment"* (Shleifer & Vishny, 1997). In that sense, it describes the rules and regulations by which the management is expected to run a company. The predominant way of shareholders influencing the management activities in US corporations is exercised through proposals during the general annual meeting. The specific rules for the corresponding proposal process are set by the Securities and Exchange Commission (SEC). Accordingly, shareholders can exercise their voting rights to vote for the proposals. Besides submitting proposals, shareholders can ordinarily vote for the composition of the board of directors, which enables large shareholders to vote in favor of having their own board seat representatives. The board of directors is a core element in the decision-making process of a company. A seat on the board gives large shareholders the ability to influence the management and monitor its actions directly (Gillan & Starks, 2000).

Clearly, investor types are distinct from each other and are not even homogeneous within their own group. They differentiate themselves along various characteristics, such as investment horizon, value creation, risk preference, and investment strategy. With regard to this thesis, we focus on six investor classes according to their impact on ESG scores: states, institutional investors, individual investors, banks, corporations and pension funds.

### 2.3.1 State Ownership

State ownership refers to shares held by governments or government-related institutions. Corresponding investments are primarily undertaken by sovereign wealth funds (SWFs) and are typically financed by a nation's commodity export revenues or by assets traded directly from official foreign exchange reserves (Butt et al., 2008).
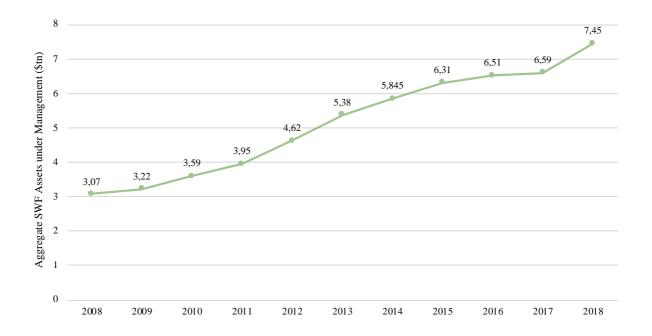
Of the several classes of sovereign wealth funds, the so-called stabilization funds represent the majority in terms of total assets under management. These funds are mainly managed by resource-rich countries, which aim to reduce their dependence on oil and save for future generations, as non-renewable resources will run out sooner or later. The *Government Pension Fund of Norway* (also known as the *Norwegian Oil Fund*) or the *Abu Dhabi Investment Authority* are prominent examples of stabilization funds. A second important group of SWFs are those funded by accumulated reserves primarily not related to commodities, such as the *China Investment Corporation (CIC)* or the *Singapore Government Investment Company (GIC).* These funds exist mainly in Asia (Beck & Fidora, 2008). Sovereign wealth funds invest in a broad spectrum of assets and in most cases have a substantial exposure to foreign investments. Over the last decade, SWFs have recorded remarkable growth, creating a powerful actor on financial markets and in the global economy caused by their large size, with more than USD 8 trillion in assets under management (Sovereign Wealth Fund Rankings, 2019; see *Figure 1*).

Apart from investing for the purpose of saving for future generations, governments also participate in companies because specific firms might have a political and strategic value for the country (e.g., energy sector, arms industry, aerospace) or solely to support certain regions. Using direct investments by acquiring shares in these companies attempts to control significant industries, as well as to pursue other political goals. Developments towards sustainability might represent one aspiration (Klein et al., 2010). By acting in accordance with national interests, governments not only have a financial mandate but also an ethical one. The majority of

countries clearly aim to address environmental and social issues, which are often managed and regulated by taxation. However, governments also try to undertake actions towards sustainability via their portfolio investments (OECD, 2010).

*Figure 1: Aggregate SWF Assets under Management*
*The figure shows the increasing amount of assets under management by sovereign wealth funds and thereby indicates their larger influence on the capital market. The figure is based on: The 2018 Preqin Sovereign Wealth Fund Review.*



### 2.3.2 Institutional Ownership

Institutional ownership refers to shares held by institutional investors, such as hedge and mutual funds, private equity and venture capital funds, as well as brokerage firms and equivalents. Pension funds technically also belong to the group of institutional investors, but with respect to our thesis, we consider pension funds as their own group, due to their substantial size and influence on the financial markets and their corresponding long-term investment horizon. Institutional investors principally represent the largest category of shareholders investing a considerable part of their funds in the stock market. Their primarily goal is to achieve financial returns and manage the risks in the best interests of their clients (OECD, 2010).

In view of ESG performance, Butler and Wong (2011) state that institutional investors should have a strong motivation to encourage companies in the development of sustainability, arguing that institutional investors have a great responsibility due to their large size and their impact on capital markets. Jo and Harjoto (2011) indicated that institutional investors are positively

correlated with CSR engagement. For them, institutional investors are aware of the benefits that come along with improvements in CSR-related areas. However, institutional investors primarily invest with the expectation of positive financial returns to satisfy the demands of their clients. This could result in disregarding other, non-financially driven aspects, such as developments regarding sustainability (Dam & Scholtens, 2012).

### 2.3.3 Individual Ownership

Individual ownership refers to investments made by private individuals, which represents a specific group of investors. There are various reasons why economists tend to have a different view on individuals than on institutions. In particular, individuals are characterized as having behavioral biases, while institutions are considered to be well-informed investors (Kaniel et al., 2008). Due to the relatively large costs to obtain information, especially in relation to the limited size of their portfolio, individuals use much less information than institutional investors. In addition, most individual investors have neither sufficient understanding nor the capability to apply the recommended valuation methods used by institutions (De Bondt, 1998).

Individuals have various reasons for investing in stocks besides the motive of maximizing returns. Barber and Odean (2000) argue that some individuals might participate in the stock market because of the pure enjoyment of gambling. Sialm and Starks (2012) point at investors who are motivated primarily by tax incentives. However, with regard to this thesis, we focus on companies' top investors, who can be regarded as being well-informed and are often represented by families or insiders, such as the founders of a company. Their main goal is to preserve wealth in the family and transfer control to future generations. Thus, this group portrays a typical long-term investor (Stein, 1989).

In connection with CSR, family-controlled firms tend to respond more positively to normative forces; consequently, they exhibit a higher sustainability performance than their nonfamily-controlled counterparts. For them, the conservation of socio-emotional wealth (such as reputation) has a significant role in their strategic decisions. In contrast, stock ownership by insiders, particularly the CEO, impacts CSR performance negatively, since compensation is usually based on the firm's financial performance (Berrone et al., 2010; Block & Wagner, 2011). McLachlan and Gardner (2004) indicated that substantial differences exist between a socially responsible investor and a conventional one with regard to their beliefs and perceptions of moral intensity - and, consequently, to their investment decision-making.

### 2.3.4 Bank Ownership

Banks have several benefits from equity investments in companies. They can profit from promising financial returns instead of receiving merely the conservative debt payoff. Moreover, they have a better capability in monitoring the potential borrower and its management, which reduces agency costs and default risk. Lastly, banks can obtain additional information and establish a closer relationship to the counterparty. Occasionally, banks own shares in a company because they combine lending with a direct investment. However, in most cases the financial motives are the predominant reason for banks holding shares in other companies (Allen & Santomero, 1997; Diamond, 1984).

With regard to ESG performance, banks have a substantial impact on society due to their important role as financial intermediaries. They price and value assets, monitor borrowers, manage financial risks, and organize our payment system (Greenbaum & Thakor, 2007). In order to fulfill their function, banks require a certain behavior from companies and individuals. Accordingly, Cowton and Thompson (2000) argue that banks are under an obligation to require sustainable behavior from their customers, due to their unique position in the capital market. Scholtens (2009) investigated how banks deal with corporate social responsibility and illustrated that the awareness of banks in relation to social responsibility has improved significantly in recent years. This might be a result of the increasing importance of reputation for banks, which is a crucial factor for attracting new customers and retaining old ones. Clearly, a positive CSR appearance affects the reputation of a bank and how it is recognized by potential customers, who are increasingly concerned about environmental, social, and governance issues (Tran, 2014).

### 2.3.5 Corporate Ownership

Corporate ownership relates to shares held by firms. Apart from the prospect of purely financial returns, strategic decisions such as promising mergers and acquisitions (M&A) are dominantly the reason for companies investing in other firms (Dam & Scholtens, 2012). However, the fact that takeovers mainly result in abnormal negative returns for the acquirer indicates that the financial component might not be the predominant driver of these investments (Andrade et al., 2001). While the shareholders of the target company usually enjoy positive returns, investors of the acquiring firm frequently experience a loss. Several studies investigated this phenomenon and attempted to provide explanations for why companies continue to invest in other firms despite the value destruction. Seth et al. (2000) found that managers undertake acquisitions not only on behalf of the underlying value maximizing motive. Evidence suggest that executives

might engage in mergers with the intention of managerial empire building. In addition, managers oftentimes overvalue their target company due to overconfidence (Doukas & Petmezas, 2007). Nevertheless, the main objectives of mergers and acquisitions are strategic ownership motives, representing the interests of the acquiring shareholders. For example, the efficiency theory posits that mergers are undertaken to achieve synergies and thus to create value (Trautwein, 1990).

With regard to corporate investments and CSR, companies increasingly incorporate the sustainability aspect into their decision-making process. This is done either voluntarily as part of their strategy or as a reaction to growing pressure from activist shareholders (Deng et al., 2013). In addition, the branding motive represents an issue that should be considered. By investing in another firm with a good reputation, the acquirer also expects a positive effect on their own reputation (Becker-Olsen et al., 2006; Delgado-García et al., 2010). However, it is unclear how important these factors are in a M&A process. Dam and Scholtens (2018) argue that sustainability concerns represent only a subordinate role in the decision-making process of potential acquirers.
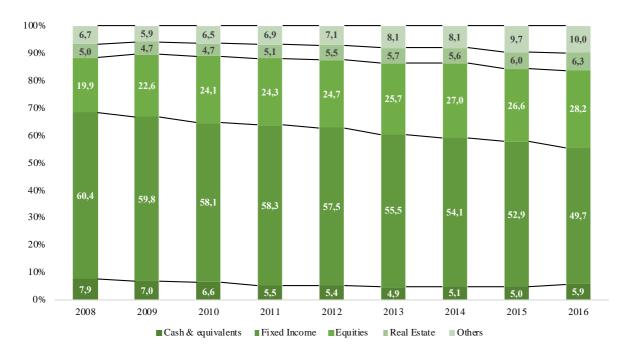
### 2.3.6 Pension Fund Ownership

By pooling social risks, pension funds act as an insurance and provide income in times of retirement. Corresponding to hedge funds, mutual funds, and equivalent investors, pension funds can be assigned to the class of institutional investors, which principally invest to achieve financial returns and to manage risks on behalf of their ultimate investors (OECD, 2017). As one of the largest providers of capital, with total assets of more than USD 16 trillion under management, pension funds represent a major actor on the financial market (Public Pension Rankings, 2019). Hence, they are in a unique position to have a significant impact on market participants. Pension funds primarily pursue their power by submitting shareholder proposals.

Traditionally, global pension funds have invested heavily in fixed income such as government and high-quality corporate bonds. However, driven by the current structural low interest rate environment, funds have begun shifting their investments towards equities and alternatives over the last few years, therefore increasing their direct impact on portfolio companies as well (State Street Global Advisors, 2018; see *Figure 2*).

In regard to sustainability, several studies argue that firms benefit in the long run by investing in CSR. Accordingly, as typical long-term investors, pension funds should be interested in their portfolio companies moving towards more sustainability. Cox et al. (2004) established that long-term institutional ownership is positively related to CSR. Moreover, Neubaum and Zahra (2006) investigated the relationship between US state pension funds and CSR performance and identified a positive effect. In contrast, other studies have documented a negative relation or none at all between pension funds and CSR performance - suggesting that, in investment decisions, funds are predominantly driven by financial factors and less by CSR considerations. Furthermore, they argue that managers of pension funds lack expertise with corporate management (Barnea & Rubin, 2010; Del Guercio & Hawkins, 1999; Schneider & Cox, 2010).

*Figure 2: Pension Fund Investments*
*Shifting focus of pension funds from Fixed Income towards Equities. This figure is based on a 2018 report of State Street Global Advisors: How do Public Pension Funds invest?*



## 2.4 Ownership Concentration

Various previous studies have investigated the effect of ownership concentration on corporate governance. Nevertheless, views regarding this issue differ. On the one hand, Jensen and Meckling (1976) claim that large shareholders can monitor the management at lower costs and more effectively. Majority shareholders have greater incentives in controlling and monitoring the management, as they benefit the most from the mitigation of agency problems. Therefore, ownership concentration can prevent managers from exploiting firm resources to satisfy their

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own personal interests (Shleifer & Vishny, 1986). Demsetz and Lehn (1985) observed that with increasing concentration of ownership, the degree to which costs and benefits are born rises, in a way that major shareholders are more likely to be active in corporate governance to prevent information asymmetries. Accordingly, large shareholders attempt to mitigate the relatively high risk associated with their large holdings in a company and to benefit financially from the reduced agency problem.

On the other hand, shareholder concentration can also give rise to severe agency conflicts. In particular, Barclay and Holderness (1989) suggested that large shareholders might use their power to secure private benefits, which are not in line with other shareholders' interests. In that sense, company resources are not distributed efficiently amongst all shareholders, and at the expense of shareholders with lower stakes in a firm.

On the context of sustainability, existing studies are inconclusive as well. Dam and Scholtens (2013) investigated the relationship between ownership concentration and CSR amongst European multinational firms and found ownership concentration to be significantly related to CSR policies. In addition, they determined that CSR performance is negatively associated with concentration, indicating that CSR performance deteriorates with more concentrated ownership. According to them, corporate social performance can be viewed as the private provision of a public good. Large shareholders are not willing to pay a relatively high price for social performance to the benefit of all others and to the detriment of their own financial performance. This attitude can be explained by the "free-rider problem" in which the effort of one large shareholder is enjoyed by many other minority shareholders (Grossman & Hart, 1980). Hence, this effect might inhibit the efforts towards sustainability improvements. However, Anderson and Reeb (2003) argue that majority shareholders are interested in the long-term survival of the firm and care considerably about their own reputation, which is strongly associated with that of the firm. Thus, they are more willing to engage in the company's social and environmental performance to conserve their reputation and to benefit from the positively associated, long-term impact of CSR on the firm's performance.

## 3. Research Question and Hypotheses

As we discussed in chapter 2, there are substantial differences between investors. Various ownership types have differing roles and responsibilities in society, follow different investment objectives, and have access to different information channels (Lopatta et al., 2017). The investor's strategy and the horizon of the investment, as well as other characteristics, highly influence the commitment within the invested companies to foster sustainability. Thus, the following research question can be formulated:

*"What influence does the ownership structure have on the ESG score?"*

In order to address this research question, and considering previous research, we have formulated seven hypotheses to test. As outlined before, every ownership type comes with different characteristics. Hence, we expect the manner and the intensity of how each investor type engages in ESG related issues to be heterogeneous. The relationship between the type of owner and ESG could be either negative, positive, or neutral. Based on our extensive literature research and our own considerations, we formulate the following hypotheses.

The first area warranting further analysis is the relationship between state ownership and ESG performance. The state has to face many conflicting goals (Dam & Scholtens, 2012). As Bénabou and Tirole (2010) state, moral values are decisive too when making investment considerations. This might be of particular importance for a state investor dealing with the high ethical expectations of society. In line with Klein et al. (2010), we argue that sustainability might represent one intention. Consequently, our first hypothesis is the following:

*Hypothesis 1a: State ownership has a positive influence on ESG score.*

Investors that are potentially predominantly driven by financial motives, such as institutional investors, focus extensively on firm value and will therefore assess every CSR investment made by the company more critically (Dam & Scholtens, 2012). Neubaum and Zahra (2006) found that short-term institutional investors are associated negatively with CSR engagement.[1] Following the argumentation that the predominant goal for institutional investors is to

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[1] It is important to mention that we did not include typical long-term institutional investors such as pension funds and insurance companies in the class of institutional investors when formulating this hypothesis; rather, we separated them into their own class.

maximize profits and manage risk for their clients and themselves (OECD, 2010), the following hypothesis can be stated:

*Hypothesis 1b: Institutional investors have a negative influence on ESG score.*

The characteristics of the several types of individuals differ. However, as stated earlier, in the context of this thesis we define individual owners as well-informed family or insider investors. Nevertheless, individual investors are far more restricted in their ability to gather information and process it than large institutional investors, as individual investors mostly have a limited portfolio size and risk capacity (De Bondt, 1998; Van der Burg & Prinz, 2006). We assume that some individual investors certainly engage in CSR. However, we follow the report published by Eurosif (2018), which concluded that sustainable encouraged investments made by individuals are growing but still make up only a small fraction of the overall investments. Therefore, we hypothesize:

*Hypothesis 1c: Individual ownership does influence ESG score in a negative way.*

Since banks and financial institutions are only intermediaries who manage their clients' money on the basis of their wishes and risk requirements (Dam & Scholtens, 2012), they mainly aim to adapt their strategy towards market demands. Hence, we believe that, as the requests for sustainable investments is increasing, banks and trusts engage in these matters in their portfolio companies. We assume that banks benefit substantially from improvements in CSR, as it reduces information asymmetries and downside risks. Hence, in line with the findings of Lopatta et al. (2017), our next hypothesis is the following:

*Hypothesis 1d: Banks have a positive influence on ESG performance.*

As argued before, the main motive for corporations to invest in other companies is mergers and acquisitions (Dam & Scholtens, 2012). If companies with a higher sustainability performance want to merge with their respective investment, they might already have experienced positive outcomes from CSR engagement, which could lead to an increased awareness of CSR regarding their investment company as well. Companies that perform better have superior access to resources (Cochran & Wood, 1984; Waddock & Graves, 1997), have enhanced reputations (Fombrun & Shanley, 1990; Fombrun, 2005; Freeman et al., 2007), and mitigate the risk of

regulatory, legal, or tax measures (Berman et al., 1999; Freeman, 1984; Hillman & Keim, 2001). However, since strategy considerations (e.g., achieving synergies) are the predominant objectives in mergers and acquisitions, we assume that sustainability aspects represent only a subordinate part in the decision-making process of M&A activities (in particular, since CSR engagement is still regarded as costly by many companies). Therefore, we posit:

*Hypothesis 1e: Corporate ownership has a negative influence on ESG performance.*

As shown by Cox et al. (2004) and Neubaum and Zahra (2006), long-term institutional investors seem to influence CSR in a positive way. Pension funds can be considered as the typical long-term investor. Consequently, we argue that due to their long-lasting commitment, pension funds are particularly interested in avoiding risks. As outlined before, a lack of integration of sustainability aspects into corporate management bears a number of risks (PRI, 2017). Due to their long investment period, we would therefore expect pension funds to be exceptionally concerned about these risks and hypothesize the following:

*Hypothesis 1f: Pension funds have a positive influence on the ESG performance.*

The impact of ownership concentration is the subject of conflicting arguments. If the shares in a company are widely distributed and the various shareholders have different intentions (one fund might be seeking to maximize profits while another is socially motivated), different approaches meet each other and no party can fully realize its interest. In order for the impact investor to be able to pursue social goals, she must hold a large enough claim (Chowdhry et al., 2019). Thus, if an owner places a focus on ESG, concentration is advantageous. On the contrary, Calza et al. (2016) find evidence that ownership concentration has a negative influence on environmental proactivity. If an investor holds a substantial share in a company, an investment in environmental activities benefits all other shareholders, whereas the costs are mostly carried by her and to the detriment of her financial profit. One could argue that if an investor is holding a large number of shares, she would rather engage in reducing the money that is spent in respect to improved ESG activities. In line with the findings of Calza et al. (2016) and Dam and Scholtens (2013), we hypothesize as follows:

*Hypothesis 2: Concentration has a negative influence on ESG performance.*

## 4. Data and Methodology

The following chapter first describes the process of data generation. Furthermore, the composition of the sample is outlined and the research design applied to test our hypothesis is presented. The chapter concludes with providing details about the variables used in our model.

### 4.1 Data Collection

For the scope of our analysis, we considered a dataset with all companies that were part of the *S&P 500* during the period from 01.01.2010 to 31.12.2018. Accordingly, we also included observations of companies that were not part of the *S&P 500* during the whole sample period, as we wanted to avoid a survivorship bias.[2] This provided a record of 735 companies for each of the nine years. The sample was created by matching ESG data with ownership data. We retrieved all relevant ownership and company data from *Thomson Reuters (Eikon)*.[3] The ownership data contains information about the owners, the percentages each owner held as well as the type of investor. Furthermore, we extracted data regarding a company's industry, return on assets, age, size, and leverage to pursue further analysis.

Regarding ESG data, *Bloomberg, Thomson Reuters, Sustainalytics, Vigeo Eiris* and *RobecoSam* are frequently used sources. As for the company data, we decided to use the *Thomson Reuters* database to retrieve ESG data. *Thomson Reuters* provides data on over 7,000 companies globally going back to 2002 and thereby covering 70% of the global market cap (Refinitiv, 2019).

This paper focuses on the *S&P 500* for several reasons. First, due to the large size of the companies included, the index is one of the best representations of the U.S. stock market and thus has a significant impact on global financial markets. Second, due to its importance, more data is available, especially with regard to ESG scores. Finally, the US market is the most important single country market in terms of sustainable investments (GSIR, 2018).

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[2] Survivorship bias is the tendency to consider the performance of existing stocks or funds in the market as a representative ample without taking into account those that have gone bankrupt. Distortion of survival may lead to overestimation of the historical performance and general attributes of a fund or market index (Brown et al., 1992).

[3] *Thomson Reuters (Eikon)* is a multinational media and financial information provider.

## 4.2 Sample Description

This section is intended to provide a concise and comprehensive overview of the data used in the subsequent models for the purpose of testing the hypotheses stated in chapter 3. We expect a change in the ownership structure to not have immediate influence on the ESG score. Rather, we assume that it takes the investor at least one year to have an impact. Consequently, we match the ownership data with the ESG data from one year afterwards. In that sense, our dataset for the investors includes observations from 01.01.2009 until 31.12.2017, whereas the dataset for ESG scores was collected during the time period 01.01.2010 to 31.12.2018. As a result, we had a total of 6,615 observations (735 companies times 9 years). Nevertheless, the *Thomson Reuters* dataset did not provide comprehensive information for all companies. Hence, we had to exclude 1,239 observations due to lacking ESG scores and 97 observations due to missing ownership information. Furthermore, 579 observations had no sufficient control variable information and were therefore excluded as well. Our final sample consists of 4,700 observations. For each company, the accumulated shareholdings of the 30 largest owners have been aggregated into seven classes. Please see *Table 1* for the sample derivation information.

**Table 1: Sample Derivation Company Data**
*The table displays the process of the sample construction. The final sample consists of 4,700 observations after missing values were deleted.*

| Sample Derivation | |
|---|---:|
| Initial observations | 6,615 |
| Excluding the ones without ESG score | - 1,239 |
| | 5,376 |
| Excluding the ones without ownership data | - 97 |
| | 5,279 |
| Excluding the ones with missing control variables | - 579 |
| **Final Sample** | **4,700** |

In our initial dataset, the observations of investors were categorized into 15 different types. Please see *Table 2* for a comprehensive list and the occurrence of each type. Investment advisors as well as hedge funds are by far the most prominent investors in our sample, whereas some other investor types occur rarely, such as institutions or government agencies. These investors were later classed together to a heterogenous group (see in more detail chapter 4.4.2).

*Table 2: Investor Types by Categories*[4]
*The table illustrates the number of observations per investor type. All investor types with less than 10 observations have been deleted, as no meaningful conclusions can be drawn.*

| Investor Types | |
|---|---:|
| Investment Advisor/Hedge Fund | 64,330 |
| Investment Advisor | 52,938 |
| Hedge Fund | 8,626 |
| Pension Fund | 5,906 |
| Research Firm | 4,199 |
| Sovereign Wealth Fund | 3,884 |
| Individual Investor | 2,505 |
| Bank and Trust | 1,558 |
| Insurance Company | 773 |
| Corporation | 485 |
| Private Equity | 143 |
| Foundation | 102 |
| Venture Capital | 47 |
| Holding Company | 45 |
| Other Insider Investor | 12 |
| **Total** | 145,553 |
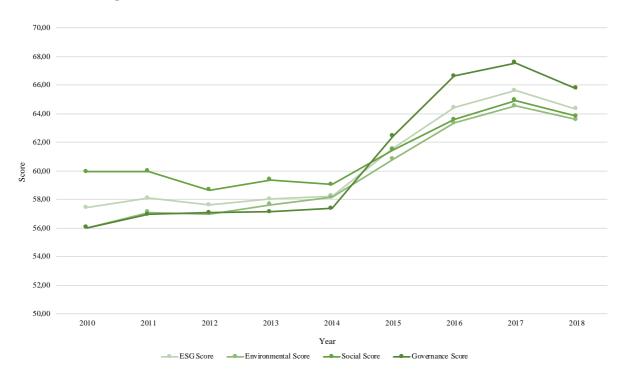
*Figure 3* provides an overview of the evolution of the average *total ESG, Environmental, Social,* and *Governance scores* over the observation period. As can be observed, there is a clear trend towards rising scores, which confirms our previously formulated statements that companies more and more are incorporating sustainability aspects into their decision-making process. While the scores stayed nearly constant until 2014, an intense increase can be observed in the past few years. One potential reason for the decline in scores in 2018 might be the fact that not all ESG data for this year has been reported yet and therefore the sample was smaller.

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[4] The rationale for the observations in *Table 2* being much higher than in *Table 1* is the accumulation of ownership data into classes.

*Figure 3: Development of the Scores over the Dataset*
*The figure shows the average for ESG, Environmental, Social and Governance score in our dataset over the period 2010 to 2018.*



## 4.3 Research Design

This section is intended to provide a concise description of the methodology used to answer our research question and to check the hypotheses stated in chapter 3. First, we introduce the model used to test whether the ownership structure has an influence on the ESG score: a *fixed effects model* has been established, with the ESG score as the dependent variable and the different ownership types as the explanatory variables, while fixing industries as well as time and firm effects. Described in chapter 4.3.2, a second model to test the dependency on ownership concentration was set up using ownership concentration as the independent variable.

### 4.3.1 Testing the Impact of Ownership Type

We use a regression analysis to test the relationship between the various independent variables (ownership type) and the measurers of *total ESG scores*, as well as the individual scores for environmental (E), social (S), and governance (G) performance. Several models exist in order to avoid misleading and unobserved variable biases that come from traditional panel data. In particular, a natural problem in panel data is endogeneity, which can be described as correlation between the explanatory variables and the error term (Wooldridge, 2002). Commonly used models that address issues related to panel data are the *random effects model* and the *fixed effects model*. With regard to our estimation model, we will use a *fixed effects model* (also

known as the least-squares dummy variable model or LSDV) because a specific assumption of the *random effects model* is that the unobserved effect $\alpha_i$ is uncorrelated with each explanatory variable: $\mathrm{cov}(x_{it}, \alpha_i) = 0$ (Wooldridge, 2002). However, we assume that this assumption does not hold, as we consider industry effects to be correlated with at least one explanatory variable.[5] For example, we presume industry to be correlated with leverage, since riskier industries commonly exhibit a lower leverage. Thus, we will initially use a *fixed effect model* with industry as the fixed effect estimator to account for heterogeneity between the industry characteristics (see *Table 12* in chapter 7 for all industries). In addition, we add time fixed effects and firm fixed effects in further models to control our sample data for time- and firm-specific characteristics. As mentioned before, the dependent ESG scores and the individual sub scores, as well as all the control variables, are lagged by one year, since we presume that shareholders need a certain time to have an actual impact on a company's sustainability performance. To investigate the relationship between the type of ownership and ESG performance, we estimate the following initial model:

$$(1)\ \textit{Total ESG Score}_{it} = \beta_1 Bank_{it-1} + \beta_2 State_{it-1} + \beta_3 Corporation_{it-1} + \\ \beta_4 Individual_{it-1} + \beta_5 Institutional_{it-1} + \beta_6 PensionFund_{it-1} + \beta_7 Others_{it-1} + \\ \beta_8 log(MarketCap)_{it} + +\beta_9 Leverage_{it} + \beta_{10} ROA_{it} + \beta_{11} FirmAge_{it} + \alpha_i + v_{it}$$

where *total ESG score* is the firm-specific assessment regarding sustainability performance. The variables *Bank, State, Corporation, Individual, Institutional, PensionFund,* and *Others* represent the independent variables and are measured by the percentages held in a specific company by each class of owner. We aggregate the shareholdings by ownership class, which means that if two banks each have a share of 15 percent in a firm, the variable *Bank* will have the value 30 percent related to that firm. The variables *MarketCap*, *Leverage*, *ROA,* and *FirmAge* serve as the control variables and are measured by a company's market capitalization, leverage, return on asset, and years since company incorporation, respectively. The $\alpha_i$ represents the specific fixed effect estimator that captures heterogeneity across industries, firms and time; $v_{it}$ reflects the error term. As mentioned before, all variables (dependent, independent, and control variables) are built based on data retrieved from *Thomson Reuters*.

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[5] Wooldridge (2012, p. 493) contends "In many applications, the whole reason for using panel data is to allow the unobserved effect to be correlated with the explanatory variables".

**4.3.2 Testing the Impact of Ownership Concentration**

In order to establish whether the sample exhibits effects due to ownership concentration (*Hypothesis 2*) we set up another model. Again, we consider an unobserved effect that leads us to include industry as the fixed effect estimator. In addition, we control the data for time-invariant characteristics, adding a time fixed indicator in a further model. As the measure of concentration, we apply the *Herfindahl-Hirschman Index* (please see chapter 4.4.2 for a detailed reasoning). The other variables adhere to the previous model. Therefore, the following equation was established to determine the relationship between ownership concentration and ESG score:

$$(2) \quad Total\ ESG\ Score_{it} = \beta_1 HHI_{it-1} + \beta_2 log(MarketCap)_{it} + \beta_3 Leverage_{it} + \beta_4 ROA_{it} + \beta_5 FirmAge_{it} + \alpha_i + v_{it}$$

where *total ESG Score* is the firm-specific assessment regarding sustainability performance. HHI stands for the *Herfindahl-Hirschman Index*, which measures ownership concentration and represents the independent variable. *MarketCap*, *Leverage*, *ROA,* and *FirmAge* serve as the control variables, while $\alpha_i$ represents the fixed effect estimator and $v_{it}$ reflects the error term.

**4.4 Variable Description**

The following chapter gives a detailed description of all variables used in the regression model above. Furthermore, a motivation for the selection of the chosen variables is provided.
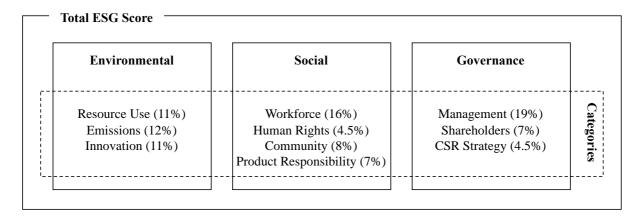
**4.4.1 Dependent Variables**

As mentioned before, quantifying sustainability through ESG scores is not an easy exercise and ratings vary widely. The companies are rated on both percentages and letters from D- to A+ (see *Table A* in Appendix for a definition of the score ranges).

The *total ESG score* consists of three different pillars, each of which are self-separated into several scores, resulting in a total of over 400 different ESG measures analyzed to generate the score for a company. For our purpose, we decided to focus on the *total ESG score* as well as on the three subscores - *Environmental, Social, Governance*. As seen in *Figure 4*, each of the three pillars in itself contains several scores with different weights.

***Figure 4: Thomson Reuters ESG Score Calculation***
*The figure below illustrates the composition of the total ESG score, as well as of its subscores.*
*The figure is based on Refinitiv 2019.*

| Total ESG Score | | |
|---|---|---|
| **Environmental** | **Social** | **Governance** |
| Resource Use (11%)<br>Emissions (12%)<br>Innovation (11%) | Workforce (16%)<br>Human Rights (4.5%)<br>Community (8%)<br>Product Responsibility (7%) | Management (19%)<br>Shareholders (7%)<br>CSR Strategy (4.5%) |

*Categories*

The environmental score measures how efficiently the company shifts towards eco-efficient solutions in its supply chain (*Resource Use*), and whether it is committed and effective regarding the reduction of emissions (*Emissions*). Furthermore, it measures the firm's capacity to reduce environmental costs and burdens for its customers through new solutions (*Innovation*). The social score consists of four categories. First, the company's performance on offering a good place to work is measured by job satisfaction of its employees, as well as by an assessment of safety, diversity, and development aspects (*Workforce*). Additionally, it is checked whether the company complies with human rights conventions (*Human Rights*). Also, the commitment towards being a good citizen, protecting public health, and adhering to business ethics is assessed (*Community*). A firm should furthermore produce quality goods and services, integrating the health, safety, integrity, and data privacy of the customer (*Product Responsibility*). Within the Governance part, the company is also assessed on how committedly and effectively it incorporates corporate governance best practices in its management (*Management*). Companies treating shareholders equally and using effective anti-takeover devices receive higher scores (*Shareholder*). Lastly, companies should incorporate the ESG dimensions in their day-to-day decision-making processes (*CSR Strategy*) (Refinitiv, 2019).

### 4.4.2 Independent Variables

To test *Hypothesis 1a-f,* the ownership type serves as the independent variable. In our original dataset, the investors were classed into 15 different types. These 15 investors types were grouped into 7 classes based on their respective characteristics; namely, *Bank, State, Corporation, Individual, Institutional, PensionFund,* and *Others*. All shares held by institutional investors such as hedge funds, private equity, and investment companies are

classified as *Institutional.* Due to their size and their particular importance for the capital market, pension funds are allocated to their own class, although they also belong to the institutional investor class. Governments participating in the capital market in the form of sovereign wealth funds were grouped into the *State* class. On the basis of varying investment objectives, *Corporation* was set up as another class. Research firms have been included into the class *Bank* as our analysis of the data has shown that all research firms are banks. All further observations have been assigned to the residual group: *Others*. This group contains a large number of diverse and heterogeneous investor types. Please see *Table 3* for the detailed investor classification.

As a first step the weight of the investor classes for each company was calculated as the sum of the shares held by the investor types included in the respective class. Afterwards, to make it easier to interpret the results, the shares within each investor type have been standardized.

*Table 3: Investor Classes and Types*
*The table below illustrates our classification of the 15 investor types into 7 different investor classes. The class Others is a heterogenous group of investor types which are not clustered based on any specific characteristics.*

| Investor Classes | Investor Types |
|---|---|
| Bank | Bank and Trust<br>Research Firm |
| State | Sovereign Wealth Fund |
| Corporation | Corporation |
| Individual | Individual Investor<br>Other Insider Investor |
| Institutional | Investment Advisor/Hedge Fund<br>Investment Advisor<br>Hedge Fund<br>Venture Capital<br>Private Equity |
| Pension Fund | Pension Fund |
| Others | Insurance Company<br>Holding Company<br>Foundation |

As the independent variable for the second model (*Hypothesis 2*) we chose the *Herfindahl-Hirschman Index (HHI),* since it is a widely used measure of concentration. For example, institutions as the *Department of Justice* or the *Federal Reserve* use it as a measuring index of competitive effects of mergers. Calculated as the sum of squared market shares of the participants in a market, the *Herfindahl-Hirschman Index* can range from zero to 10,000, with

10,000 being a single owner holding 100 percent if the ownership is given as a percentage (Rhoades, 1993).

$$(3) \qquad HHI = \sum_{i=1}^{N} a_i{}^2 \ with \ a_i := \frac{x_i}{\sum_{j=1}^{N} x_i}$$

### 4.4.3 Control Variables

In line with previous literature that have investigated the effect of the type of ownership on a company's ESG performance, we perceive the following control variables to be important: size, performance, risk, age, and industry type (see Dam & Scholtens, 2012; Neubaum & Zahra, 2006; Johnson & Greening, 1999). Therefore, we use market capitalization, return on asset, and leverage as well as years since company incorporation. Industry type, time and firm are used as the fixed effect estimators. Size, which is measured by market capitalization, is of particular relevance, as studies have proven that smaller companies are less concerned with ESG. Waddock and Graves (1997) argue that larger firms attract more attention and need to disclose sustainable relevant information to a greater extent to meet shareholder demands. Gallo and Christensen (2011) suggest that only large firms are able to fully incorporate CSR activities, since it requires a sufficient amount of resources to engage in CSR. In order to ensure linear relationships, the natural logarithm has been applied for the variable market capitalization (Wooldridge, 2012).

We also controlled for a company's leverage, measured by total assets divided by total equity. Waddock and Graves (1997) highlight that firms in distress are more focused on short-term goals such as profit maximization instead of investing in long-term projects such as CSR engagement. In addition, companies in financial distress have very limited opportunities to engage in traditional CSR topics, such as philanthropy.

We use return on assets, as prior studies have indicated a relationship between ESG and financial performance (Orlitzky et al., 2003; Scholtens, 2008; Waddock & Graves, 1997). Company age (measured by the years since incorporation) is another control variable, which we include since it has a substantial influence on a company's characteristics - such as the relationship to stakeholders and the company's reputation. Mature firms have more reputational capital, which additionally is more likely to be stable compared to younger firms (Flanagan & O'Shaughnessy, 2005). A certain amount of time is also needed to establish CSR instruments in a company (Withisuphakorn & Jiraporn, 2016).

Finally, industry, time and firm are used as the fixed effect estimators to control for specific heterogeneities of firms. The industry is particularly important, since ESG performance depends substantially on industry characteristics (see *Table 12* in chapter 7).

## 5. Empirical Results

In the subsequent chapter, the findings obtained when applying the previously described models are discussed. The structure follows the order of the hypotheses as laid out in chapter 3.

### 5.1 Descriptive Statistics

*Table 4* reports the descriptive statistics of the dependent variables related to their respective ESG scores and control variables. The calculations in *Table 4* include all observations whenever a specific ownership class is invested in a company in a particular year (i.e., for each investor type an own subsample is used). For instance, if a bank and a pension fund are invested in a specific firm, the firm's ESG score is included in the calculations for each of the two investor classes.

***Table 4: Descriptive Statistics by Investor Classes[6]***
*The table below provides descriptive statistics about ESG score and the control variables by each investor class.*

| INVESTOR CLASS | Bank | State | Corporation | Individual | Institutional | Pension Fund | Others | Total Sample |
|---|---|---|---|---|---|---|---|---|
| Mean ESG | 62.044 | 61.517 | 55.021 | 54.468 | 60.408 | 61.595 | 67.234 | 60.412 |
| Min ESG | 13.346 | 8.600 | 16.265 | 16.664 | 8.600 | 8.600 | 17.475 | 8.600 |
| Max ESG | 94.485 | 97.898 | 88.715 | 94.485 | 97.898 | 97.898 | 97.898 | 97.898 |
| StdDev ESG | 16.146 | 16.470 | 16.237 | 17.127 | 16.620 | 16.414 | 16.889 | 16.620 |
| Mean ROA (in percentage) | 8.798 | 8.707 | 8.772 | 10.328 | 8.602 | 8.712 | 9.052 | 8.601 |
| Mean Leverage | 5.222 | 4.420 | 4.304 | 4.595 | 5.115 | 5.033 | 4.633 | 5.114 |
| Mean MarketCap (in USD bn) | 36.397 | 34.009 | 25.363 | 24.192 | 30.636 | 33.811 | 65.388 | 30.636 |
| Mean FirmAge (in years) | 36.907 | 35.924 | 24.808 | 31.580 | 34.046 | 34.835 | 48.932 | 34.039 |
| N | 3170 | 3606 | 395 | 1461 | 4699 | 3949 | 774 | 4700 |

The average ESG score of the whole sample data is 60.41, with a standard deviation of 16.62. Companies in which individuals or corporations are invested show a quite low average ESG score of 54.47 and 55.02, respectively. It appears that these investor classes might have a negative impact on a company's ESG performance. In contrast, companies in which banks, states, or pension funds are invested show an average ESG score that is above the total sample mean. This indicates a potential positive impact of these groups. *Table 4* gives evidence that the investor classes differ regarding the control variables as well. For example, while the market capitalization for companies with corporations and individual investors is ~ USD 25 billion, it is ~ USD 36 billion for banks. It seems that banks are invested in larger companies.

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[6] Since the ESG score of one company is used in the statistical calculations for several investor classes, the summarized observations are considerably higher than the overall observations of our sample. For instance, if a bank and a pension fund are invested in the same company, the company's ESG score counts for one observation of each investor class. However, in the total sample the ESG score of that company only counts for one observation.

**5.2 The Influence of Ownership Type (*Hypotheses 1a-f*)**

Our regression results are depicted in *Table 5*. The findings indicate a statistically significant relationship between the various ownership types and ESG performance. We see that the control variables for size, and firm age exhibit the expected signs. We find a strong and significant positive relationship between size, measured by market capitalization, and *total ESG score* in all models. Since larger companies presumably attract more public attention and also have greater resources to engage in CSR, their scores seem to be considerably higher (Gallo & Christensen, 2011; Waddock & Graves, 1997). Firm age has a significant positive impact on ESG performance in all models, as we expected. It presumably requires a certain time to establish CSR instruments in a firm, and younger firms first need to build up these mechanisms (Withisuphakorn & Jiraporn, 2016). The control variable for performance, measured by return on assets, has a statistically significant and negative effect in all models, which is contrary to our expectations. However, Friedman (1970) argues that engagements in CSR are rather costly for a company and might reduce competitiveness, which might negatively affect financial performance. Risk, as measured by leverage, is insignificant in model (1) and (2). Thus, we excluded leverage as a control variable in further models to see the true marginal effects of the other variables.

With regard to the various ownership types, we find in model (1) that the variable *Others* is not significant (t = -1.357, p > .1), which is what we expected. Since this class only contains a large number of diverse and heterogeneous investor types, no conclusions can be drawn. Consequently, we excluded the variable *Others* in all further regression models.

We find a significant and positive relationship between state ownership and ESG performance in all models except model (5). However, that model only accounts for firm and time fixed effects, which is an imprecise assumption, since ESG scores do not vary substantially over time for a specific firm. The poor fitting of model (5) can also be observed by the significantly lower $R^2$. Our finding of a positive relationship is in line with our expectation (*Hypothesis 1a*). States act on behalf of national interests, which clearly include ethical and moral aspects. Accordingly, we see that governments on average seem to promote corporate social responsibility through their investment portfolios.

### Table 5: Ownership Type and ESG Performance

*The analyzed data sample contains 4,700 observations. The table shows the outcomes of several fixed effects regressions of ownership type on ESG performance including several control variables. In model (1) to (3) only industry fixed effects were applied. Model (4) accounts for industry and time fixed effects whereas model (5) only accounts for firm effects. For brevity, industry, firm and time fixed effects (dummy variables) are not reported. The robust t values for all variables obtained through the sandwich estimator are reported in parenthesis. The significance level is denoted by asterisks at the \*\*\*(1%), \*\*(5%) and \*(10%) levels.*

| VARIABLES | (1) ESG Score | (2) ESG Score | (3) ESG Score | (4) ESG Score | (5) ESG Score |
|---|---|---|---|---|---|
| Corporation | -1.732*** | -1.684*** | -1.686*** | -1.760*** | -0.787** |
| | (-6.461) | (-5.979) | (-5.981) | (-5.990) | (-2.547) |
| Institutional | -2.339*** | -2.232*** | -2.223*** | -2.416*** | -0.268 |
| | (-4.866) | (-4.435) | (-4.462) | (-4.738) | (-0.894) |
| Individual | -1.719*** | -1.686*** | -1.687*** | -1.712*** | -0.575* |
| | (-3.137) | (-3.095) | (-3.085) | (-3.134) | (-1.792) |
| Bank | -0.268 | -0.237 | -0.233 | -0.375 | -0.567** |
| | (-0.760) | (-0.669) | (-0.662) | (-1.015) | (-2.395) |
| State | 0.803** | 0.810** | 0.808** | 0.598* | 0.489 |
| | (2.183) | (2.156) | (2.147) | (1.708) | (1.297) |
| Pension Fund | -0.494** | -0.465* | -0.463* | -0.418 | 0.128 |
| | (-2.093) | (-1.950) | (-1.928) | (-1.494) | (0.651) |
| Others | -0.717 | | | | |
| | (-1.357) | | | | |
| Log(MarketCap) | 5.744*** | 5.714*** | 5.718*** | 5.456*** | 2.259*** |
| | (10.495) | (10.581) | (10.547) | (10.139) | (5.280) |
| Lev | 0.009 | 0.009 | | | |
| | (0.684) | (0.697) | | | |
| ROA | -0.252*** | -0.250*** | -0.251*** | -0.236*** | 0.002 |
| | (-4.965) | (-4.876) | (-4.886) | (-4.488) | (0.110) |
| Firm Age | 0.095*** | 0.096*** | 0.096*** | 0.093*** | 1.197*** |
| | (4.686) | (4.861) | (4.866) | (4.745) | (13.894) |
| | | | | | |
| Adj. Rsquared | 0.273 | 0.271 | 0.271 | 0.289 | 0.214 |
| N | 4700 | 4700 | 4700 | 4700 | 4700 |
| Fixed | Industry | Industry | Industry | Industry & Time | Firm & Time |

The results in *Table 5* also support *Hypothesis 1b*. Models (1) to (4) show a significantly negative relationship between institutional ownership and ESG performance. Institutional investors on average appear to be predominantly driven by financial motives and neglect sustainability considerations in their investment decisions. This argument is strengthened by the fact that our data sample primarily classified short-term institutional investors as

institutional investors.[7] Consequently, our results are in line with the studies of Neubaum and Zahra (2006), who also indicated a negative relationship between short-term institutional investors and CSR performance.

On the basis of the results in *Table 5*, we also find support for *Hypothesis 1c*. All models indicate a significantly negative relationship between individual investors and ESG performance. The finding suggests that investments made by CSR-concerned individuals represent only a small fraction of the overall investments. Moreover, individuals in our sample are insiders in many cases, who tend to be motivated predominantly by financial motives. This finding is in line with those of Barnea and Rubin (2010) and Dam and Scholtens (2012).

The results of models (1) to (4) indicate that ownership by banks is not significantly associated with ESG performance. Based on our sample analysis, we reject our *Hypothesis 1d* - i.e., a positive relationship between bank ownership and CSR. This result contrasts with the findings of Lopatta et al. (2017), who observed a significantly positive relationship. However, our findings are in line with the results of Dam and Scholtens (2012), as they also failed to find a significant association between bank ownership and CSR.

Consistent with the expectation expressed in *Hypothesis 1e*, the results show a strong significant and negative association between corporate ownership and ESG performance in all models. Thus, corporations on average seem to neglect sustainability considerations in their investment-decision process. This result is congruent with most findings in the academic literature (see e.g., Andrade et al., 2001; Dam & Scholtens, 2012; Doukas & Petmezas, 2007).

Lastly, the estimation results do not confirm our expectations regarding the positive impact of pension fund ownership on ESG performance. Models (2) and (3) show a negative relationship at the 10% significance level. However, model (4) does not indicate a significant result. Therefore, we reject *Hypothesis 1f* of an anticipated positive association. The potential negative impact can be explained by the fact that pension funds might be predominantly driven by financial motives and less by CSR considerations regarding their investment decisions. In that sense, Cox and Wicks (2011) argue that pension funds are legally obliged to prioritize economic

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[7] We categorized typical long-term institutional investors such as pension funds and insurance companies to other explanatory variables. Accordingly, we use shares held by pension funds as an own explanatory variable due to the importance of pension funds on capital markets (see chapter 2.3.6 above). Shares held by insurance companies are aggregated to the variable *Others*.

factors whenever there is a trade-off between economic considerations and other responsibilities.

The results of model (4), in which industry as well as time fixed estimators were applied, show that the coefficients change only slightly compared to model (3), in which only industry was used as the fixed effect estimator. In addition, the significance levels do not alter considerably. This result can be explained by the fact that time specific characteristics only have a limited effect on ESG scores, since the scores do not change substantially over the years (see *Figure 3* in chapter 4.2).

ESG is a multidimensional construct composed of three different subscores, which themselves consist of several measures. Therefore, we also analyzed the respective subscores separately by applying another *fixed effects regression.*  As we can observe in *Table 6*, the influence of the ownership classes on the subscores differs. In line with Strike et al. (2006), we find that if all engagement on ESG issues is aggregated to one single score, this fails to recognize whether the company might be performing well in one area, but poorly in another. For example, while the *total ESG score*, as well as the *Social score* and in particular the *Environmental score,* happen to be very negatively influenced by institutional ownership, the *Governance score* does not experience the same amount of negative influence. An explanation might be that institutional investors value improvements in corporate governance more than advancement regarding environmental or social issues. Due to lower agency costs, higher corporate governance standards are often in line with a higher shareholder value (see e.g., Bebchuck et al., 2009; Gompers et al., 2003; Shleifer & Vishny, 1997), and therefore might be valued to a larger extent by institutional investors. We can also see that the positive coefficient for size is substantially greater in model (2), in which the environmental score is used, than in model (4), in which the governance score is used. One potential explanation for these findings is that especially for improvements concerning environmental issues, a certain capacity of resources is required. Developments regarding a firm's corporate governance structure in contrast appear to be implemented without large capital requirements. Additionally, with increasing size the public attention rises (Waddock & Graves, 1997). Larger companies might therefore be particularly interested in complying to society's expectations regarding environmental concerns. However, to make more sophisticated interpretations, a thorough analysis of the components of the subscores would be necessary.

## Table 6: Ownership Type and ESG Subscores

*The data sample analyzed contains 4,700 observations. The table shows the outcomes of several fixed effects regressions of ownership type on ESG performance and the specific pillars. Model (1) gives the influence of the variables on the total ESG score, whereas the other models show the results for the subscores E, S, and G. For brevity, industry and time fixed effects (dummy variables) are not reported. The robust t values for all variables obtained through the sandwich estimator are reported in parenthesis. The significance level is denoted by asterisks at the \*\*\*(1%), \*\*(5%), and \*(10%) levels.*

| VARIABLES | (1) ESG Score | (2) Environmental Score | (3) Social Score | (4) Governance Score |
|---|---|---|---|---|
| Corporation | -1.760*** | -1.352*** | -1.351** | -2.695*** |
| | (-5.990) | (-3.697) | (-2.543) | (-4.921) |
| Institutional | -2.416*** | -3.418*** | -2.312*** | -1.442** |
| | (-4.738) | (-5.283) | (-3.515) | (-2.337) |
| Individual | -1.712*** | -1.222* | -1.729*** | -2.166*** |
| | (-3.134) | (-1.911) | (-2.691) | (-3.865) |
| Bank | -0.375 | -0.232 | -0.216 | -0.664 |
| | (-1.015) | (-0.543) | (-0.455) | (-1.399) |
| State | 0.598* | 0.627 | 0.479 | 0.693** |
| | (1.708) | (1.274) | (1.254) | (2.191) |
| Pension Fund | -0.418 | -0.140 | -0.235 | -0.955*** |
| | (-1.494) | (-0.300) | (-1.441) | (-2.689) |
| Log(MarketCap) | 5.456*** | 7.226*** | 6.47*** | 2.314*** |
| | (10.139) | (9.410) | (13.273) | (3.008) |
| ROA | -0.236*** | -0.325*** | -0.186*** | -0.199*** |
| | (-4.488) | (-4.592) | (-3.641) | (-3.656) |
| Firm Age | 0.093*** | 0.102*** | 0.106*** | 0.069*** |
| | (4.745) | (3.840) | (5.159) | (2.811) |
| | | | | |
| Adj. Rsquared | 0.289 | 0.245 | 0.261 | 0.125 |
| N | 4700 | 4700 | 4700 | 4700 |
| Fixed | Industry & Time | Industry & Time | Industry & Time | Industry & Time |

## 5.3 The Influence of Ownership Concentration (*Hypothesis 2*)

As our next step, we examined *Hypothesis 2*, concerning the impact of ownership concentration on ESG scores. So far there is no consensus among scientists about the direction of relationship. The results presented in *Table 7* provide evidence that the negative effect outweighs the positive one and that concentration influences ESG performance negatively when only considering fixed industry ($t = -9.477$, $p < .01$) and additionally fixed time ($t = -9.479$, $p < .01$) effects (see Calza et al., 2016; Dam & Scholtens, 2013). Accordingly, we can reject the reasoning for a positive influence as argued by Chowdhry et al. (2019). The reason for the negative relationship might be that large shareholders are primarily focused on profit maximization and do not value potential benefits that come with ESG improvements. Furthermore, as argued by Dam and

Scholtens (2013), corporate social performance can be considered as a public good. Correspondingly, major shareholders are not willing to pay a relatively high price for the benefit of all others. In other words, their personal benefits do not compensate for the high costs they have to pay. Nevertheless, it must be noted that the coefficient is only slightly negative.

Except for ROA, the control variables again show the expected signs in all models. With increasing market capitalization and firm age, the ESG scores rise. Leverage again is insignificant in model (1) and appears to not have an impact on ESG scores. Consequently, it is excluded in model (2) and (3). ROA is significantly negative in all models. Although evidence exists for various relationships, we expected a positive relationship between a firm's ESG performance and financial performance. Nevertheless, our findings corroborate some previous research results on the ESG performance relationship (e.g., Aupperle et al., 1985).

***Table 7: Ownership Concentration and ESG Performance***
*The table illustrates the outcomes of the fixed effects regression of the Herfindahl-Hirschman Index (HHI) on the total ESG score. In model (1) and (2), the industry has been fixed, whereas in model (3) the industry as well as the year were fixed. For brevity, the industry and time fixed effects (dummy variables) are not reported. The robust* t *values for all variables obtained through the sandwich estimator are reported in parenthesis. The significance level is denoted by asterisks at the \*\*\*(1%), \*\*(5%), and \*(10%) levels.*

| VARIABLES | Model (1) ESG Score | Model (2) ESG Score | Model (3) ESG Score |
|---|---|---|---|
| HHI | -0.005*** | -0.005*** | -0.005*** |
| | (-9.486) | (-9.477) | (-9.479) |
| Log(MarketCap) | 6.582*** | 6.582*** | 6.409*** |
| | (13.254) | (13.234) | (13.123) |
| Leverage | 0.008 | | |
| | (0.582) | | |
| ROA | -0.260*** | -0.261*** | -0.243*** |
| | (-5.026) | (-5.043) | (-4.571) |
| Firm Age | 0.102*** | 0.102*** | 0.100*** |
| | (5.196) | (5.195) | (5.079) |
| | | | |
| Adj. Rsquared | 0.262 | 0.262 | 0.280 |
| N | 4700 | 4700 | 4700 |
| Fixed | Industry | Industry | Industry & Time |

To further investigate the influence of ownership concentration, an additionally comparison between dispersed and concentrated ownership has been made. The *fixed effects model* with fixed industry and ownership was applied separately on two subsamples, i.e. all companies with ownership of more than 15% as well as companies with less than 15%. The results depicted in

*Table 8* provide support that the negative impact increases with concentration as it can be seen for corporations and institutional investors. The coefficient of both is substantially higher, meaning that if a corporation or an institutional investor holds shares in a company with concentrated ownership, the negative influence on the *total ESG score* increases considerably. This supports our *Hypothesis 2* stating that concentration negatively impacts the ESG score. Our previous findings indicated that state ownership has a positive influence on the ESG score. Nevertheless, in the setting of concentrated ownership this effect disappears.

**Table 8: Comparison Dispersed and Concentrated Ownership**
*The table compares the results of our model by applying it to (1) all companies with dispersed ownership (no investor with more than 15%) and (2) concentrated ownership (at least one owner with more than 15%). For brevity, the industry and time fixed effects (dummy variables) are not reported. The robust t values for all variables obtained through the sandwich estimator are reported in parenthesis. The significance level is denoted by asterisks at the ***(1%), **(5%) and *(10%) levels.*

| VARIABLES | (1) ESG Dispersed ($< 15\%$) | (2) ESG Concentrated ($> 15\%$) |
|---|---|---|
| Corporation | -0.631 | -3.697*** |
| | (-1.312) | (-4.061) |
| Institutional | -2.009*** | -3.254*** |
| | (-3.375) | (-2.968) |
| Individual | -1.956** | -2.165 |
| | (-2.303) | (-1.603) |
| Bank | -0.046 | -0.761 |
| | (-0.113) | (-0.815) |
| State | 0.742** | 1.358 |
| | (2.510) | (1.077) |
| Pension Fund | 0.009 | -0.886 |
| | (0.022) | (-1.353) |
| Log(MarketCap) | 5.565*** | 5.125*** |
| | (10.099) | (5.846) |
| ROA | -0.238*** | -0.253*** |
| | (-4.628) | (-2.733) |
| Firm Age | 0.085*** | 0.219*** |
| | (4.556) | (6.595) |
| | | |
| Adj. Rsquared | 0.278 | 0.365 |
| N | 4166 | 534 |
| Fixed | Industry & Time | Industry & Time |

## 6. Robustness Check

The analysis chapter indicates significant relationships between ownership type and ESG score, as well as between ownership concentration and ESG. A comprehensive robustness check is required to assess the validity of the obtained results and was therefore conducted. First, to comply with the requirements of the Gauss-Markov theorem, the properties of the regressions were tested for violations. We test three assumptions: (1) multicollinearity, (2) homoscedasticity, and (3) serial correlation (Gujarati, 2004). Moreover, we controlled our results by using a different time lag and by using distinctive variables.

Firstly, the independent variables were tested on (1) multicollinearity. Multicollinearity is found when one regressor can be derived from a linear combination of one or more other regressors of the regression model (Gujarati, 2004). To identify potential multicollinearity, we derived a pairwise correlation matrix. The ESG score and the three subscores are highly correlated, since the ESG score is by definition computed from the three individual scores. But as they were used in separate models only, this does not influence our validity. Market capitalization seems to be highly correlated both with the scores and with institutional ownership (-0.504) (See *Table 9)*. In order to verify our observations, we additionally applied the Variance Inflation Factor (VIF) test. Multicollinearity is usually given when the VIF lies above 10 (Alin, 2010). With a mean of 1.13, our results indicate that our variables are free from multicollinearity.

### Table 9: Pairwise Correlation Matrix
*The table illustrates the pairwise correlations of all variables used for our regression analysis.*

| VARIABLES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 ESG_Score | 1.000 | | | | | | | | | | | | | | | |
| 2 Env_Score | 0.868 | 1.000 | | | | | | | | | | | | | | |
| 3 Soc_Score | 0.855 | 0.682 | 1.000 | | | | | | | | | | | | | |
| 4 Gov_Score | 0.690 | 0.380 | 0.386 | 1.000 | | | | | | | | | | | | |
| 5 Corporation | -0.098 | -0.022 | -0.074 | -0.159 | 1.000 | | | | | | | | | | | |
| 6 Institutional | -0.335 | -0.322 | -0.329 | -0.143 | -0.095 | 1.000 | | | | | | | | | | |
| 7 Individual | -0.228 | -0.159 | -0.184 | -0.217 | 0.072 | 0.013 | 1.000 | | | | | | | | | |
| 8 Bank | 0.105 | 0.083 | 0.099 | 0.069 | -0.060 | -0.204 | -0.005 | 1.000 | | | | | | | | |
| 9 State | 0.137 | 0.109 | 0.084 | 0.141 | -0.072 | 0.020 | -0.083 | 0.077 | 1.000 | | | | | | | |
| 10 PensionFund | 0.010 | 0.019 | -0.012 | 0.023 | -0.062 | 0.087 | -0.038 | -0.058 | -0.002 | 1.000 | | | | | | |
| 11 Others | 0.186 | 0.173 | 0.180 | 0.075 | -0.060 | -0.298 | -0.058 | 0.082 | -0.014 | -0.119 | 1.000 | | | | | |
| 12 HHI | -0.307 | -0.252 | -0.295 | -0.194 | 0.263 | 0.602 | 0.320 | -0.093 | -0.009 | -0.010 | -0.130 | 1.000 | | | | |
| 13 Market_Cap | 0.476 | 0.450 | 0.480 | 0.205 | -0.008 | -0.504 | -0.134 | 0.088 | 0.051 | -0.058 | 0.257 | -0.385 | 1.000 | | | |
| 14 Leverage | 0.184 | 0.134 | 0.144 | 0.184 | -0.037 | -0.105 | -0.189 | 0.064 | 0.031 | 0.031 | 0.065 | -0.115 | 0.099 | 1.000 | | |
| 15 ROA | -0.026 | -0.017 | 0.026 | -0.089 | -0.003 | -0.122 | 0.131 | 0.048 | -0.030 | -0.037 | 0.038 | -0.077 | 0.142 | -0.402 | 1.000 | |
| 16 Age | 0.248 | 0.205 | 0.237 | 0.150 | -0.121 | -0.216 | -0.014 | 0.169 | 0.065 | -0.042 | 0.169 | -0.174 | 0.140 | 0.077 | 0.082 | 1.000 |

(2) Homoscedasticity is given if the errors in the estimated model exhibit constant variance. In contrast, heteroscedasticity persists if the errors do not show constant levels of variance. To test for heteroscedasticity, we have applied the Breusch-Pagan test, which checks the null-hypothesis of homoscedasticity (Wooldridge, 2012). In our case, the test showed p-values below 5%, implying the presence of heteroscedasticity. Consequently, we adapted our models with robust standard errors to make it valid in the presence of heteroscedasticity.

(3) Serial correlation or autocorrelation persist if the error terms of the regression ordered in time exhibit correlation (Gujarati, 2004). To test our regression for serial correlation, we conducted the Breusch-Godfrey test (Wooldridge, 2012). The results indicate that we can reject the null-hypothesis of serial correlation within the idiosyncratic errors and thus meet the requirements of the Gauss-Markov theorem. For an overview of the test outcomes, please see Appendix, *Table B.*

It can be argued that a time period of one year is not sufficient for an investor to achieve large changes to the ESG practices of its investment company. Therefore, we conducted a robustness check of our results by including a time lag of three years instead. As it can be seen in *Table 10*, the results reveal the same relationships signs and significance levels as our one-year values, thereby lending further support to our obtained results.

***Table 10: Controlling for Time Lag***

*The table illustrates the outcomes of a fixed effects regression with fixed industry and time effects. In particular, it shows a comparison between (1) a one-year time lag and (2) a three-year time lag. For brevity, the industry and time (dummy) variables are not reported. The robust* t *values for all variables obtained through the sandwich estimator are reported in parenthesis. The significance level is denoted by asterisks at the \*\*\*(1%), \*\*(5%), and \*(10%) levels.*

| VARIABLES | (1) ESG Score 1 Year | (2) ESG Score 3 Years |
|---|---|---|
| Corporation | -1.760*** | -1.390*** |
| | (-5.990) | (-5.026) |
| Institutional | -2.416*** | -2.266*** |
| | (-4.738) | (-3.782) |
| Individual | -1.712*** | -1.620*** |
| | (-3.134) | (-2.716) |
| Bank | -0.375 | -0.373 |
| | (-1.015) | (-0.908) |
| State | 0.598* | 0.725** |
| | (1.708) | (2.392) |
| Pension Fund | -0.418 | -0.56** |
| | (-1.494) | (-2.215) |
| Log(MarketCap) | 5.456*** | 5.915*** |
| | (10.139) | (10.979) |
| ROA | -0.236*** | -0.228*** |
| | (-4.488) | (-4.678) |
| Firm Age | 0.093*** | 0.081*** |
| | (4.745) | (4.438) |
| | | |
| Adj. Rsquared | 0.289 | 0.310 |
| N | 4700 | 3633 |
| Fixed | Industry & Time | Industry & Time |

Concerning the model for concentration, we performed a further regression based on all observations of the ownership data disregarding an investor's specific type. Thus, we do not aggregate the shares held by each investor to the specific investor class but use dummy variables instead. The dummy variable equals 1 if an investor exceeds a particular percentage of shares held in a firm; otherwise it is 0. Once again, we use a *fixed effect model* with industry and time fixed effects. Therefore, the regression equation is as follows:

$$(4)\ Total\ ESG\ Score_{it} = \beta_1 ConcentrationDummy_{it-1} + \beta_2 log(MarketCap)_{it} + \beta_4 ROA_{it} + \beta_5 FirmAge_{it} + \alpha_i + v_{it}$$

where *total ESG score* is the firm-specific assessment regarding sustainability performance. *ConcentrationDummy* represents the independent variable. *MarketCap, ROA,* and *FirmAge*

serve as the control variables; $\alpha_i$ represents the fixed effect estimator and $v_{it}$ reflects the error term. Model (1) accounts for shareholders holding more than 25% of shares in a specific company. Models (2) and (3) account for holdings of more than 15% and 10%, respectively.

The results depicted in *Table 11* support our expectations of *Hypothesis 2,* as the signs of the dummy coefficients for concentration are negative. In addition, the results suggest that the effect becomes more powerful with increasing concentration. It must be noted that all dummy coefficients are significant at the 1% level.

### Table 11: Controlling for Concentration

*The table illustrates the outcomes of the fixed effects regression of the dummy variables for concentration on the total ESG score. In model (1) the dummy accounts for shareholders holding more than 25%, whereas models (2) and (3) further include 15% and 10% shareholdings. The robust t values for all variables obtained through the sandwich estimator are reported in parenthesis. The significance level is denoted by asterisks at the \*\*\*(1%), \*\*(5%), and \*(10%) levels.*

| VARIABLES | (1) ESG Score | (2) ESG Score | (3) ESG Score |
|---|---|---|---|
| Dummy Variable 25% | -6.024*** | | |
| | (-4.333) | | |
| Dummy Variable 15% | | -2.678*** | |
| | | (-3.513) | |
| Dummy Variable 10% | | | -1.807*** |
| | | | (-3.071) |
| Log(MarketCap) | 6.379*** | 6.377*** | 6.372*** |
| | (12.815) | (12.816) | (12.801) |
| ROA | -0.245*** | -0.245*** | -0.245*** |
| | (-4.514) | (-4.514) | (-4.519) |
| Firm Age | 0.110*** | 0.110*** | 0.110*** |
| | (5.872) | (5.875) | (5.873) |
| | | | |
| Adj. Rsquared | 0.265 | 0.265 | 0.265 |
| N | 145553 | 145553 | 145553 |
| Fixed | Industry & Time | Industry & Time | Industry & Time |

## 7. Caveats

To begin with, our study design has led to a relatively high number of observations. Nevertheless, these vary for the respective investor classes. While we obtained a huge amount of observations for institutional investors, those for individual ones are much lower. Accordingly, for some classes a generalization of results must be considered carefully. However, this only reflects the nature of the equity market, in which institutional investors play a major role.

Furthermore, an extensive body of literature addresses the causality of the relationship between ownership and ESG. It can be argued that investors do not influence ESG positively, but that the level of the ESG score is the reason for an investment/disinvestment. As found for the relation between ESG and financial performance by Waddock and Graves (1997), a virtuous cycle might also exist where ownership appears to be both a predictor and a consequence of ESG performance.

It is also important to note that the findings are highly dependent on the ESG measurement method used. Halbritter and Dorfleitner (2015) provide proof that the rating concept used as well as the time interval of the obtained information influence which effects can be reported. Berg et al. (2019) show that when comparing five different sustainability ratings (namely, *KLD, Sustainaliytics, Vigeo-Eiris, Asset4,* and *RobecoSam*) the correlation between the ratings is 0.61 on average. To put this into context, the correlation between credit ratings of Standard & Poor's and Moody's is 0.99. We are mitigating this problem by obtaining all data from the same data source. Nevertheless, when trying to replicate our findings with other sustainability data sources instead, problems might occur due to these differences and potentially lead to differing results.

Lastly, it also needs to be questioned how much change ownership can actually achieve. The extent to which an improvement of ESG is manageable is also dependent on the industry in which the company is operating. If a company is engaging in highly polluting industries, for example, the impact achievable through ownership engagement will be limited. The industry comparison depicted in *Table 12* supports this assumption. As can be seen, the means range from 41.80 for investment holding companies to 76.28 for industrial conglomerates, which indicates the differences of ESG score levels in the various industries.

***Table 12: Descriptive Statistics Company Industries***
*The table below provides descriptive statistics about the total ESG scores in the industries the companies of our final sample are operating in.*

| INDUSTRIES | Mean ESG | Min ESG | Max ESG | StdDev ESG | N |
|---|---|---|---|---|---|
| Applied Resources | 57.739 | 35.707 | 82.899 | 13.532 | 61 |
| Automobiles & Auto Parts | 51.296 | 20.619 | 83.327 | 17.245 | 85 |
| Banking & Investment Services | 59.535 | 22.915 | 88.909 | 16.925 | 376 |
| Chemicals | 63.158 | 21.750 | 84.451 | 12.796 | 123 |
| Collective Investments | 65.597 | 39.470 | 79.433 | 13.556 | 9 |
| Cyclical Consumer Products | 54.603 | 24.496 | 86.771 | 15.971 | 168 |
| Cyclical Consumer Services | 55.612 | 18.311 | 92.079 | 16.899 | 264 |
| Energy - Fossil Fuels | 60.166 | 17.475 | 92.487 | 16.036 | 375 |
| Food & Beverages | 67.774 | 36.567 | 92.454 | 12.131 | 202 |
| Food & Drug Retailing | 68.603 | 36.778 | 87.149 | 9.945 | 61 |
| Healthcare Services & Equipment | 59.120 | 20.044 | 93.265 | 17.320 | 328 |
| Industrial & Commercial Services | 50.983 | 21.882 | 87.878 | 18.086 | 177 |
| Industrial Conglomerates | 76.276 | 41.096 | 92.160 | 14.535 | 42 |
| Industrial Goods | 58.256 | 8.600 | 91.435 | 18.009 | 301 |
| Insurance | 57.970 | 23.527 | 90.292 | 15.667 | 195 |
| Investment Holding Companies | 41.798 | 31.042 | 49.538 | 6.646 | 9 |
| Mineral Resources | 62.100 | 34.487 | 88.715 | 14.645 | 70 |
| Personal & Household Products & | 56.398 | 22.500 | 85.312 | 19.239 | 87 |
| Pharmaceuticals & Medical Resear | 66.416 | 32.119 | 90.622 | 15.243 | 138 |
| Real Estate | 60.966 | 16.664 | 91.426 | 15.649 | 260 |
| Renewable Energy | 56.331 | 45.438 | 69.055 | 8.115 | 13 |
| Retailers | 62.252 | 24.149 | 91.008 | 15.951 | 302 |
| Software & IT Services | 62.749 | 18.462 | 94.485 | 18.016 | 299 |
| Technology Equipment | 61.767 | 19.292 | 97.898 | 17.774 | 325 |
| Telecommunications Services | 62.583 | 30.654 | 84.829 | 15.603 | 47 |
| Transportation | 62.801 | 20.914 | 81.591 | 13.596 | 112 |
| Utilities | 64.831 | 29.460 | 87.228 | 12.136 | 271 |
| Total sample | 60.412 | 8.600 | 97.898 | 16.622 | 4700 |

## 8. Conclusion and Future Research

In this paper, we investigated the relationship between ownership structure and ESG performance. More specifically, we examined the impact of institutional investors, banks, states, corporations, individuals, and pension funds on a firm's sustainability performance, as measured by the *total ESG score* and the specific subscores for environmental (E), social (S), and governance (G) categories. Investors differ significantly concerning their commitment to CSR measures, since each investor has his or her own view about the issue and holds a different role and position in society. For example, a state is obliged to act on behalf of its citizens' interests and must consider moral and ethical aspects in a different way than institutional investors do. Accordingly, institutional investors might be predominantly driven by profit maximization while disregarding other factors such as social responsibility. Moreover, we investigated the effect of shareholder concentration on ESG performance. The interests of large shareholders might differ from those of minority shareholders in the context of CSR, and a large shareholder presumably has a stronger influence on a company's strategic decision than small diversified shareholders.

The sample analyzed comprises data on the top 30 shareholders of each company that was part of the *S&P 500* between January 2010 and December 2018. The shares held by each investor in a respective firm were aggregated and classified to the specific ownership classes, which we ultimately investigated.

The results suggest that ownership structure has an impact on ESG in such a way that different investor types influence a company's sustainability performance in distinctive ways. More specifically, company ownership by a state is positively related to a company's engagement towards CSR. Firm ownership by institutional investors, corporations, and individuals indicates a negative association with respect to a firm's ESG performance. It appears that these investor types prioritize financial motivations over corporate social responsibility considerations. Furthermore, ownership by banks and pension funds seems to exhibit a neutral influence on their respective ESG scores. In this regard, our first perception of a differential CSR awareness by each shareholder type was confirmed.

The results can be explained by the following reasoning. Institutional investors seem to be driven predominantly by financial returns because they act on behalf of their own investors, which tend to be primarily profit orientated. Corporations are mainly motivated by strategic

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considerations, such as promising mergers and acquisitions activities with respect to shareholdings in other companies. Accordingly, sustainability aspects appear to represent only a subordinate concern in their investment decision-making. Individuals are often hampered by information disadvantages, and the fraction of CSR-concerned individuals still represents only a small number of the overall investments. States seem to exert their moral and ethical mandate through their portfolio investments and also encourage companies towards developments in CSR. The neutral influence of banks and pension funds regarding ESG performance can be explained by the fact that these investors assess the costs and benefits of CSR, which seem to outweigh each other. While pension funds might value the positive long-term effects of CSR, they seem to be driven by short-term financial motives at the same time.

Moreover, we find a significant negative relationship between shareholder concentration and ESG performance in a way that with increasing concentration, the negative impact becomes stronger. We follow the argumentation of Dam and Scholtens (2013) stating that corporate social performance can be regarded as a public good. As a consequence, large shareholders are not willing to pay a relatively high price to the benefit of all others.

To ensure the reliability of the empirical results, we performed several robustness checks, including tests that account for multicollinearity, homoscedasticity, and serial correlation. Furthermore, we used a divergent set of explanatory variables to confirm our findings.

This paper adds value to the existing research in the field of organizations and corporate social responsibility. Yet many open questions remain that warrant future research. Future researchers could investigate the specific investment motives of different ownership types more deeply, particularly with regard to ESG considerations in their decision-making process. Moreover, our analysis spanned nine years. It would be interesting to carry out a similar study addressing a longer period to strengthen the results. However, the ESG topic is relatively new, and comprehensive data are limited in terms of availability. We are also aware of the potential endogeneity issue, in the sense that it is not clear whether certain types of shareholders impact a firm's ESG performance or whether specific firms attract certain types of shareholders. Hence, we do not draw any conclusion regarding the direction of causality. Other approaches may help to study the causality between ownership structure and ESG performance, which could be investigated in future research.

The implications of our results may be of interest for policy makers, as CSR has recently become a key topic on the public agenda. In this sense, governments aim to steer companies towards more sustainability. Correspondingly, our findings suggest that it could be decisive for policy makers not only to act on the company level, but also to stimulate the respective owners towards a higher awareness of CSR.

In accordance with the statement cited in the beginning of this paper, an increasing number of investors concerned with sustainability will highlight the importance of ESG for society as a whole. In this sense, companies are already in a period of tremendous change, but "*we are only at the early stages.*"

# References

Agle, B.R., Mitchell, R.K., & Sonnenfeld, J.A. (1999). Who Matters to CEOs? An Investigation of Stakeholder Attributes and Salience, Corporate Performance and CEO Values. *Academy of Management Journal, 42*(5), 507-525.

Alin, A. (2010). Multicollinearity. *Wiley Interdisciplinary Reviews: Computational Statistics, 2*(3), 370-374.

Allen, F., & Santomero, A.M. (1997). The theory of financial intermediation. *Journal of Banking & Finance, 21*(11-12), 1461-1485.

Anderson, R.C., & Reeb, D.M. (2003). Founding-Family Ownership and Firm Performance: Evidence from the S&P 500. *The Journal of Finance, 58*(3), 1301-1328.

Andrade, G., Mitchell, M., & Stafford, E. (2001). New Evidence and Perspectives on Mergers. *The Journal of Economic Perspectives, 15*(2), 103-120.

Aupperle, K.E., Carroll, A.B., & Hatfield, J.D. (1985). An empirical examination of the relationship between corporate social responsibility and profitability. *Academy of Management Journal, 28*(2), 446–463.

Barber, B., & Odean, T. (2000). Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors. *The Journal of Finance, 55*(2), 773-806.

Barclay, M.J., & Holderness, C.G. (1989). Private benefits from control of public corporations. *Journal of Financial Economics, 25*(2), 371-395.

Barnea, A., & Rubin, A. (2010). Corporate Social Responsibility as a Conflict Between Shareholders. *Journal of Business Ethics, 97*(1), 71-86.

Bebchuk, L.A., Cohen, A., & Ferrell, A. (2009). What Matters in Corporate Governance? *Review of Financial Studies, 22*(2), 783-827.

Beck, R., & Fidora, M. (2008). The Impact of Sovereign Wealth Funds on Global Financial Markets. *Intereconomics, 43*, 349-358.

Becker-Olsen, K., Cudmore, A., & Hill, R.P. (2006). The impact of perceived corporate social responsibility on consumer behavior. *Journal of Business Research, 59*(1), 46-53.

Bénabou, R., & Tirole, J. (2010). Individual and Corporate Social Responsibility. *Economica, 77*(305), 1-19.

Berg, F., Kölbel, J., & Rigobon, R. (2019). Aggregate Confusion: The Divergence of ESG Ratings. MIT Sloan Research Paper No. 5822-19. Available at: http://dx.doi.org/10.2139/ssrn.3438533.

Berman, S., Wicks, A., Suresh, K., & Jones, T. (1999). Does stakeholder orientation matter? The relationship between stakeholder management models and firm financial performance. *Academy of Management Journal, 42*(5), 488-506.

Berrone, P., Cruz, C., Gomez-Mejia, L.R., & Larraza-Kintana, M. (2010). Socioemotional Wealth and Corporate Responses to Institutional Pressures: Do Family-Controlled Firms Pollute Less? *Administrative Science Quarterly, 55*(1), 82-113.

Black, S.B. (1997). Shareholder Activism and Corporate Governance in the United States. *The New Palgrave Dictionary of Economics and the Law, 3*, 459-465.

Blackrock, & Ceres (2015). *21st Century Engagement, Investor Strategies for Incorporating ESG Considerations into Corporate Interactions.* Retrieved from https://www.blackrock.com/corporate/literature/publication/blk-ceres-engagementguide2015.pdf.

Block, J.H., & Wagner, M. (2011). The Effect of Family Ownership on Different Dimensions of Corporate Social Responsibility: Evidence from Large US Firms. *Business Strategy and the Environment, 23*(7), 475-492.

Bowen, H.R. (1953). *Social responsibilities of a businessman (1st edition).* New York: Harper.

Brown, S., Goetmann, W., Ibbotson, R., & Ross, S. (1992). Survivorship bias in performance studies. *The Review of Financial Studies, 5*(4), 553-580.

Butler, P., & Wong, S. (2011). Recent trends in institutional investor responsibilities and stewardship. *Pensions: An International Journal, 16*(2), 80–85.

Butt, S., Shivdasani, A., Stendevad, C., & Wyman, A. (2008). Sovereign Wealth Funds: A Growing Global Force in Corporate Finance. *Journal of Applied Corporate Finance, 20*, 73-83.

Carroll, A.B. (1999). Corporate social responsibility: Evolution of a definitional construct. *Business & Society, 38*(3), 268-295.

Cheng, B., Ioannou, I., & Serafeim, G. (2014). Corporate Social Responsibility and Access to Finance. *Strategic Management Journal, 35*(1), 1-23.

Chowdhry, B., Davies, S.W., & Waters, B. (2019). Investing for Impact. *The Review of Financial Studies, 32*(3), 864-904.

Cochran, P., & Wood, R. (1984). Corporate social responsibility and financial performance. *Academy of Management Journal, 27*(1), 42-56.

Cowton, C.J., & Thompson, P. (2000). Do Codes Make a Difference? The Case of Bank Lending and the Environment. *Journal of Business Ethics, 24*(2), 165–178.

Cox, P., & Wicks, P.G. (2011). Institutional Interest in Corporate Responsibility: Portfolio Evidence and Ethical Explanation. *Journal of Business Ethics, 103*(1), 143-165.

Cox, P., Brammer, S., & Millington, A. (2004). An Empirical Examination of Institutional Investor Preferences for Corporate Social Performance. *Journal of Business Ethics, 52*(1), 27-43.

Dahlsrud, A. (2006). How corporate social responsibility is defined: an analysis of 37 definitions. *Corporate Social Responsibility and Environmental Management, 15*(1), 1-13.

Dam, L., & Scholtens, B. (2012). Does Ownership Type Matter for Corporate Social Responsibility? *Corporate Governance: An International Review, 20*(3), 233-252.

Dam, L., & Scholtens, B. (2013). Ownership Concentration and CSR Policy of European Multinational Enterprises. *Journal of Business Ethics, 118*(1), 117-126.

Danielson, M.G., & Karpoff, J.M. (1998). On the uses of corporate governance provisions. *Journal of Corporate Finance, 4*(4), 347-371.

De Bondt, W. (1998). A portrait of the individual investor. *European Economic Review, 42*(3-5), 831-844.

Del Guercio, D., & Hawkins, J. (1999). The motivation and impact of pension fund activism. *Journal of Financial Economics, 52*(3), 293-340.

Delgado-García, J.B., de Quevedo-Puente, E., & de la Fuente-Sabaté, J.M. (2010). The Impact of Ownership Structure on Corporate Reputation: Evidence From Spain. *Corporate Governance: An International Review, 18*(6), 540-556.

Demsetz, H., & Lehn, K. (1985). The Structure of Corporate Ownership: Causes and Consequences. *Journal of Political Economy, 93*(6), 1155-1177.

Deng, X., Kang, J.-K., & Low, B. (2013). Corporate Social Responsibility and Stakeholder Value Maximization: Evidence from Mergers. *Journal of Financial Economics, 110*(1), 87-109.

Diamond, D.W. (1984). Financial Intermediation and Delegated Monitoring. *The Review of Economic Studies, 51*(3), 393-414.

Doukas, J.A., & Petmezas, D. (2007). Acquisitions, Overconfident Managers and Self-attribution Bias. *European Financial Management, 13*(3), 531-577.

Eccles, R.G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science, 60*(11), 2835-2857.

Eccles, R.G., Kastrapeli, M.D., & Potter, S.J. (2017). How to Integrate ESG into Investment Decision-Making: Results of a Global Survey of Institutional Investors. *Journal of Applied Corporate Finance, 29*(4), 125-133.

Erhemjamtsa, O., & Huang, K. (2019). Institutional ownership horizon, corporate social responsibility and shareholder value. *Journal of Business Research, 105*, 61-79.

European Commission (2001). *Promoting a European framework for corporate social responsibility.* Green paper, Office for Official Publications of the European Communities, Brussels, Belgium.

Eurosif (2013). *Shareholder stewardship: European ESG engagement practices.* Retrieved from http://www.eurosif.org/wp- content/uploads/2014/06/eurosif- report- shareholder-stewardship.pdf.

Eurosif (2016). *European SRI study.* Retrieved from. http://www.eurosif.org/wp-content/uploads/2016/11/SRI-study-2016-HR.pdf.

Eurosif (2018). *European SRI study 2018.* Retrieved from http://www.eurosif.org/wp-content/uploads/2018/11/European-SRI-2018-Study.pdf.

Financial Times (2018, October 22). BlackRock stakes claim on 'sustainable investing' revolution. Retrieved from https://www.ft.com/content/f66b2a9e-d53d-11e8-a854-33d6f82e62f8.

Flanagan, D.J., & O'Shaughnessy, K.C. (2005). The Effect of Layoffs on Firm Reputation. *Journal of Management, 31*(3), 445-463.

Fombrun, C. (2005). A world of reputation research, analysis and thinking-building corporate reputation through CSR initiatives: evolving standards. *Corporate Reputation Review, 8*(1), 7-12.

Fombrun, C., & Shanley, M. (1990). What's in a name? Reputation building and corporate strategy. *Academy of Management Journal, 33*(2), 233-258.

Freeman, R.E. (1984). *Strategic Management: A Stakeholder Approach.* Boston, Massachusetts: Piman.

Freeman, R.E., Harrison, J.S., & Wicks, A.C. (2007). *Managing for stakeholders: survival, reputation, and success.* New Haven, Connecticut: Yale University Press.

Friedman M. (1970). The Social Responsibility of Business Is to Increase Its Profits. *The New York Times Magazine*. September, 13 1970.

Gallo, P.J., & Christensen, L. (2011). Firm Size Matters: An Empirical Investigation of Organizational Size and Ownership on Sustainability-Related Behaviors. *Business & Society, 50*(2), 315-349.

Gifford, G. (2010). Effective shareholder engagement: The factors that contribute to shareholder salience. *Journal of Business Ethics, 92*, 79–97.

Gillan, S.L, & Starks, L.T. (2000). Corporate governance proposals and shareholder activism: the role of institutional investors. *Journal of Financial Economics, 57*(2), 275-305.

Global Compact (2019a). *United Nations Global Compact.* Retrieved from https://www.globalcompact.de/de/ueber-uns/dgcn-ungc.php?navid=539859539859.

Global Compact (2019b). *The Ten Principles of the UN Global Compact.* Retrieved from https://www.unglobalcompact.org/what-is-gc/mission/principles.

Global Sustainable Investment Alliance (2017). *Value of selected Socially Responsible Investment (SRI) strategies worldwide in 2014 and 2016* (in billion U.S. dollars). In Statista. Retrieved from https://www.statista.com/statistics/742099/sri-strategies-value/.

Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate Governance and Equity Prices. *Quarterly Journal of Economics, 118*(1), 107-55.

Greenbaum, S., & Thakor, A. (2007). Contemporary Financial Intermediation. Oxford: Elsevier Academic Press.

Grossman, S.J., & Hart, O.D. (1980). Takeover Bids, The Free-Rider Problem, and the Theory of the Corporation. *The Bell Journal of Economics, 11*(1), 42-64.

GSIR (2018). *Global Sustainable Investment Review.* Retrieved from http://www.gsi-alliance.org/wp-content/uploads/2019/03/GSIR_Review2018.3.28.pdf.

Gujarati, D.N. (2004). *Basic Econometrics* (4th edition). McGraw-Hill.

Halbritter, G., & Dorfleitner, G. (2015). The wages of social responsibility - where are they? A critical review of ESG investing. *Review of Financial Economics, 26*(1), 25-35.

Hartzmark, S.M., & Sussman, A.B. (2019). Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows. European Corporate Governance Institute (ECGI) - Finance Working Paper No. 565/2018. Available at: http://dx.doi.org/10.2139/ssrn.3016092.

Hillman, A.J., & Keim, G.D. (2001). Shareholder value, stakeholder management, and social issues: what's the bottom line? *Strategic Management Journal, 22*(2), 125-139.

Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360.

Jo, H., & Harjoto, M.A. (2011). Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility. *Journal of Business Ethics, 103*(3), 351–383.

Johnson, R.A., & Greening, D.W. (1999). The Effects of Corporate Governance and Institutional Ownership Types on Corporate Social Performance. *The Academy of Management Journal, 42*(5), 564-576.

Kaniel, R., Saar, G., & Titman, S. (2008). Individual Investor Trading and Stock Returns. *The Journal of Finance, 63*(1), 273-310.

Klein, P., Mahoney, J., McGahan, A., & Pitelis, C. (2010). Toward a theory of public entrepreneurship. *European Management Review, 7*, 1-15.

Lopatta, K., Jaeschke, R., Canitz, F., & Kaspereit, T. (2017). International Evidence on the Relationship between Insider and Bank Ownership and CSR Performance. *Corporate Governance: An International Review, 25*(1), 41-57.

McLachlan, J., & Gardner, J. (2004). A Comparison of Socially Responsible and Conventional Investors. *Journal of Business Ethics, 52*(1), 11-25.

McWilliams, A., & Siegel, D.S. (2000). Corporate social responsibility and financial performance: Correlation or misspecification. *Strategic Management Journal, 21*(5), 603-609.

Neubaum, D.O., & Zahra, S.A. (2006). Institutional Ownership and Corporate Social Performance: The Moderating Effects of Investment Horizon, Activism, and Coordination. *Journal of Management, 32*(1), 108-131.

OECD (2010). *Taxation, Innovation and the Environment.* Paris.

OECD (2017). *Pensions at a Glance.* Paris.

Orlitzky, M., Schmidt, F.L., & Rynes, S.L. (2003). Corporate social and financial performance: A meta-analysis. *Organization Studies, 24*(3), 403-441.

PRI (2015). *Fiduciary Duty in the 21st Century.* Retrieved from: https://www.unpri.org/download?ac=1378.

PRI (2016a). *Fiduciary Duty in the 21st Century US Roadmap.* Retrieved from: https://www.unpri.org/download?ac=4353.

PRI (2016b). *Investor Obligations and Duties in 6 Asian Markets.* Retrieved from https://www.unpri.org/download?ac=1393.

PRI (2017). *The SDG Investment Case.* Retrieved from https://www.unpri.org/download?ac=5909.

PRI (2019a). *An Investor Initiative in Partnership with UNEP Finance Initiative and the UN Global Compact.* Retrieved from https://www.unpri.org/download?ac=6303.

PRI (2019b). *Annual Report 2019.* Retrieved from https://d8g8t13e9vf2o.cloudfront.net/Uploads/t/j/z/priannualreport2019_901594.pdf.

Public Pension Rankings (2019, November). *Sovereign Wealth Fund Institute.* Retrieved from https://www.swfinstitute.org/fund-rankings/public-pension.

Rhoades, S.A. (1993). *The Herfindahl-Hirschman Index.* In: Federal Reserve Bulletin, March.

Schneider, M., & Cox, P. (2010). Is corporate social performance a criterion in the overseas investment strategy of U.S. pension plans? An empirical examination. *Business & Society, 49*(2), 252-289.

Scholtens, B. (2009). Corporate Social Responsibility in the International Banking Industry. *Journal of Business Ethics, 86*(2), 159–175.

Seth, A., Song, K., & Pettit, R. (2000). Synergy, Managerialism or Hubris? An Empirical Examination of Motives for Foreign Acquisitions of U.S. Firms. *Journal of International Business Studies, 31*(3), 387-405.

Shiu, Y.M., Yang, S.L. (2015). Does engagement in corporate social responsibility provide strategic insurance- like effects? *Strategic Management Journal, 38*(2), 455-470.

Shleifer, A., & Vishny, R.W. (1997). A Survey of Corporate Governance. *The Journal of Finance, 52*(2), 737-783.

Shleifer, A., & Vishny, R.W. (1986). Large Shareholders and Corporate Control. *Journal of Political Economy, 94*(3), 461-488.

Sialm, C., & Starks, L. (2012). Mutual Fund Tax Clienteles. *The Journal of Finance, 67*(4), 1397-1422.

Sovereign Wealth Fund Rankings. (2019, November). *Sovereign Wealth Fund Institute*. Retrieved from https://www.swfinstitute.org/fund-rankings/sovereign-wealth-fund.

SSE (2019). *10 Years of Impact and Progress.* Retrieved from https://sseinitiative.org/wp-content/uploads/2019/09/SSE-10-year-impact-report.pdf.

State Street Global Advisors (2018). *How do Public Pension Funds invest? From Local to Global Assets.* Retrieved from https://www.ssga.com/investment-topics/asset-allocation/2018/inst-how-do-ppfs-invest.pdf.

Stein, J. (1989). Efficient Capital Markets, Inefficient Firms: A Model of Myopic Corporate Behavior. *The Quarterly Journal of Economics, 104*(4), 655–669.

Strike, V.M., Gao, J., & Bansal, P. (2006). Being good while being bad: social responsibility and the international diversification of US firms. *Journal of International Business Studies, 37*(6), 850-862.

Surocca, J., Tribó, J.A., & Waddock, S. (2010). Corporate Responsibility and Financial Performance: The Role of Intangible Resources. *Strategic Management Journal, 31*(5), 463-490.

Sustainalytics (2019). *A Global Leader in ESG & Corporate Governance.* Retrieved from https://www.sustainalytics.com/.

Tran, Y.T. (2014). CSR in banking sector - A literature review and new research directions. *International Journal of Economics, Commerce and Management, 2*(11), 1-22.

Trautwein, F. (1990). Merger Motives and Merger Prescriptions. *Strategic Management Journal, 11*(4), 283-295.

Turban, D.B., & Greening, D.W. (1997). Corporate social performance and organizational attractiveness to prospective employees. *The Academy of Management Journal, 40*(3), 658-672.

UNIDO (2019). *What is CSR?* Retrieved from https://www.unido.org/our-focus/advancing-economic-competitiveness/competitive-trade-capacities-and-corporate-responsibility/corporate-social-responsibility-market-integration/what-csr.

United Nations (2019). *Sustainable Development Goals.* Retrieved from https://www.un.org/sustainabledevelopment/.

United Nations Global Compact (2014). *Guide to Corporate Sustainability.* Retrieved from https://www.unglobalcompact.org/library/1151.

United Nations Global Compact (2017). *United Nations Global Compact Progress Report 2017.* Retrieved from https://www.unglobalcompact.org/docs/publications/UN%20Impact%20Brochure_Concept-FINAL.pdf.

Van der Burg, T., & Prinz, A. (2006). Empowering small shareholders: A comparison of three instruments. *Corporate Governance: An International Review, 14*(5), 406-417.

Vigeo Eiris (2019). *The choice for responsible growth.* Retrieved from http://vigeo-eiris.com/.

Waddock, S.A., & Graves, S.B. (1997). The Corporate Social Performance-Financial Performance Link. *Strategic Management Journal, 18*(4), 303-319.

Withisuphakorn, P., & Jiraporn, P. (2016). The effect of firm maturity on corporate social responsibility (CSR): do older firms invest more in CSR? *Applied Economics Letters, 23*(4), 298-301.

Wooldridge, J.M. (2002). *Econometric Analysis of Cross Section and Panel Data.* Cambridge: The MIT Press.

Wooldridge, J.M. (2012). *Introductory econometrics: a modern approach* (5th edition). Mason OH: South-Western Cengage Learning.

World Bank (2019). *10 Years of Green Bonds: Creating the Blueprint for Sustainability Across Capital Markets.* Retrieved from https://www.worldbank.org/en/news/immersive-story/2019/03/18/10-years-of-green-bonds-creating-the-blueprint-for-sustainability-across-capital-markets.

WRI (2016). *Number of funds that incorporate environmental, social, or governance factors in the U.S. from 1995 to 2015.* In Statista. Retrieved November from https://www.statista.com/statistics/727652/number-of-us-funds-incorporating-esg-criteria/.

**Appendix**

*Table A: Grading Score Range*
*The table shows the score ranges and the respective ESG grades in Thomson Reuters Refinitiv. The table is based on Refinitiv 2019.*

| Score Range | Grade |
|---|---|
| $0.0 \leq$ score $\leq 0.083333$ | D - |
| $0.083333 <$ score $\leq 0.166666$ | D |
| $0.166666 <$ score $\leq 0.250000$ | D + |
| $0.250000 <$ score $\leq 0.333333$ | C - |
| $0.333333 <$ score $\leq 0.416666$ | C |
| $0.416666 <$ score $\leq 0.500000$ | C + |
| $0.500000 <$ score $\leq 0.583333$ | B - |
| $0.583333 <$ score $\leq 0.666666$ | B |
| $0.666666 <$ score $\leq 0.750000$ | B + |
| $0.750000 <$ score $\leq 0.833333$ | A - |
| $0.833333 <$ score $\leq 0.916666$ | A |
| $0.916666 <$ score $\leq 1$ | A + |

*Table B: Overview of Statistical Tests conducted*
*The table below summarizes the statistical tests conducted. It provides the rationale behind choosing the tests, the null hypothesis as well as the results we obtained. All tests have been applied to all models to provide a thorough robustness check.*

| Conducted Test | Rationale | Null Hypothesis | Result |
|---|---|---|---|
| Breusch-Godfrey Test | Tests for serial/ autocorrelation | $H_0$: no serial correlation in ideosyncratic errors | **No serial** correlation in our model |
| Breusch-Pagan Test | Tests for heteroscedasticity | $H_0$: constant variance | **Significant heteroscedasticity** for our models |
| Variance Inflation Factor (VIF) Test | Tests for multicollinearity | Test gives out VIFs. VIF > 10 indicates multicollinearity | Mean of 1.13 indicates that variables **are free of multicollinearity** |

### Table C: Overview of Sample Companies

*The table below illustrates the sample companies as well as their respective industry and the mean ESG score over the sample period.*

| Company Name | Industry | Mean ESG | Company Name | Industry | Mean ESG |
|---|---|---|---|---|---|
| 3M Co | Industrial Conglomerates | 87.06 | Amgen Inc | Pharma & Medical Research | 66.07 |
| A. O. Smith Corp | Industrial Goods | 41.13 | Amphenol Corp | Technology Equipment | 38.75 |
| Abbott Laboratories | Healthcare Services & Equipment | 80.50 | Anadarko Petroleum Corp | Energy - Fossil Fuels | 61.40 |
| Abbvie Inc | Pharma & Medical Research | 73.57 | Analog Devices Inc | Technology Equipment | 77.07 |
| Abercrombie & Fitch Co | Retailers | 49.51 | Andeavor | Energy - Fossil Fuels | 73.34 |
| Abiomed Inc | Healthcare Services & Equipment | 45.67 | ANSYS Inc | Software & IT Services | 50.82 |
| Accenture PLC | Software & IT Services | 87.27 | Anthem Inc | Healthcare Services & Equipment | 77.91 |
| Activision Blizzard Inc | Software & IT Services | 46.04 | Aon PLC | Insurance | 61.21 |
| Acuity Brands Inc | Cyclical Consumer Products | 49.24 | Apache Corp | Energy - Fossil Fuels | 59.94 |
| Adient PLC | Automobiles & Auto Parts | 46.34 | Apartment Investment and Management | Real Estate | 56.83 |
| Adobe Inc | Software & IT Services | 79.58 | Apergy Corp | Energy - Fossil Fuels | 49.15 |
| ADT Security Corp | Technology Equipment | 49.31 | Apollo Education Group Inc | Personal & Household Prod. & Serv. | 35.19 |
| Adtalem Global Education Inc | Personal & Household Prod. & Serv. | 29.80 | Apple Inc | Technology Equipment | 72.16 |
| Advance Auto Parts Inc | Retailers | 48.19 | Applied Materials Inc | Technology Equipment | 75.88 |
| Advanced Micro Devices Inc | Technology Equipment | 77.68 | Aptiv PLC | Automobiles & Auto Parts | 45.18 |
| AdvanSix Inc | Chemicals | 45.70 | Archer Daniels Midland Co | Food & Beverages | 67.44 |
| AES Corp | Utilities | 55.04 | Arconic Inc | Mineral Resources | 78.57 |
| Aetna Inc | Healthcare Services & Equipment | 74.00 | Arista Networks Inc | Technology Equipment | 49.67 |
| Affiliated Computer Services Inc | Software & IT Services | N/A | Arthur J Gallagher & Co | Insurance | 52.59 |
| Affiliated Managers Group Inc | Banking & Investment Services | 34.92 | Assurant Inc | Insurance | 54.00 |
| Aflac Inc | Insurance | 70.18 | AT&T Inc | Telecommunications Services | 72.98 |
| Agilent Technologies Inc | Healthcare Services & Equipment | 85.57 | Atmos Energy Corp | Utilities | 35.09 |
| Air Products and Chemicals Inc | Chemicals | 79.55 | Autodesk Inc | Software & IT Services | 83.93 |
| Airgas Inc | Chemicals | 39.65 | Automatic Data Processing Inc | Software & IT Services | 67.21 |
| AK Steel Holding Corp | Mineral Resources | 70.47 | AutoNation Inc | Retailers | 47.27 |
| Akamai Technologies Inc | Software & IT Services | 57.17 | Autozone Inc | Retailers | 57.90 |
| Alaska Air Group Inc | Transportation | 62.71 | AvalonBay Communities Inc | Real Estate | 70.05 |
| Albemarle Corp | Chemicals | 63.49 | Avery Dennison Corp | Applied Resources | 74.72 |
| Alcoa Corp | Mineral Resources | 87.62 | Avon Products Inc | Personal & Household Prod. & Serv. | 72.17 |
| Alexandria Real Estate Equities Inc | Real Estate | 50.54 | Baker Hughes Co | Energy - Fossil Fuels | 74.19 |
| Alexion Pharmaceuticals Inc | Pharma & Medical Research | 47.72 | Ball Corp | Applied Resources | 66.09 |
| Align Technology Inc | Healthcare Services & Equipment | 32.55 | Bank of America Corp | Banking & Investment Services | 76.53 |
| Allegheny Energy Inc | Utilities | N/A | Bank of New York Mellon Corp | Banking & Investment Services | 78.16 |
| Allegheny Technologies Inc | Industrial Goods | 45.01 | Baxalta Inc | Pharma & Medical Research | 29.90 |
| Allegion PLC | Technology Equipment | 41.83 | Baxter International Inc | Healthcare Services & Equipment | 75.59 |
| Allergan Inc | Pharma & Medical Research | 74.26 | BB&T Corp | Banking & Investment Services | 40.61 |
| Allergan plc | Pharma & Medical Research | 44.03 | Beam Suntory Inc | Food & Beverages | 43.55 |
| Alliance Data Systems Corp | Industrial & Commercial Services | 59.87 | Becton Dickinson and Co | Healthcare Services & Equipment | 78.59 |
| Alliant Energy Corp | Utilities | 55.72 | Bed Bath & Beyond Inc | Retailers | 63.20 |
| Allstate Corp | Insurance | 86.44 | Bemis Company Inc | Applied Resources | 42.85 |
| Alpha Appalachia Holdings LLC | Energy - Fossil Fuels | N/A | Berkshire Hathaway Inc | Insurance | 34.19 |
| Alpha Natural Resources Inc | Energy - Fossil Fuels | 49.60 | Best Buy Co Inc | Retailers | 74.00 |
| Alphabet Inc | Software & IT Services | 68.01 | Big Lots Inc | Retailers | 57.82 |
| Altaba Inc | Collective Investments | 65.60 | Biogen Inc | Pharma & Medical Research | 75.28 |
| Altera Corp | Technology Equipment | 62.48 | Bioverativ Inc | Pharma & Medical Research | N/A |
| Altria Group Inc | Food & Beverages | 74.73 | BJ Services Company LLC | Energy - Fossil Fuels | N/A |
| Amazon.com Inc | Retailers | 64.56 | Black & Decker Corp | Cyclical Consumer Products | N/A |
| Amcor PLC | Applied Resources | 73.19 | BlackRock Inc | Banking & Investment Services | 51.38 |
| Ameren Corp | Utilities | 53.61 | Bmc Software Inc | Software & IT Services | 60.24 |
| American Airlines Group Inc | Transportation | 70.67 | Boeing Co | Industrial Goods | 86.24 |
| American Electric Power Company Inc | Utilities | 72.84 | Booking Holdings Inc | Cyclical Consumer Services | 28.24 |
| American Express Co | Banking & Investment Services | 73.74 | BorgWarner Inc | Automobiles & Auto Parts | 50.48 |
| American International Group Inc | Insurance | 56.71 | Boston Properties Inc | Real Estate | 59.95 |
| American Tower Corp | Real Estate | 65.01 | Boston Scientific Corp | Healthcare Services & Equipment | 63.74 |
| American Water Works Company Inc | Utilities | 74.16 | Brighthouse Financial Inc | Insurance | 26.11 |
| Ameriprise Financial Inc | Banking & Investment Services | 60.63 | Bristol-Myers Squibb Co | Pharma & Medical Research | 79.55 |
| AmerisourceBergen Corp | Healthcare Services & Equipment | 53.67 | Broadcom Corp | Technology Equipment | 68.51 |
| Ametek Inc | Industrial Goods | 32.50 | Broadcom Inc | Technology Equipment | 39.49 |

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|---|---|---|
| Broadridge Financial Solutions Inc | Industrial & Commercial Services | 42.97 |
| Brookfield Property Reit Inc | Real Estate | 56.09 |
| Brown-Forman Corp | Food & Beverages | 58.17 |
| Burlington Northern Santa FE Corp | Transportation | N/A |
| C R Bard Inc | Healthcare Services & Equipment | 52.29 |
| C.H. Robinson Worldwide Inc | Transportation | 36.35 |
| CA Inc | Software & IT Services | 75.55 |
| Cablevision Systems Corp | Cyclical Consumer Services | 23.55 |
| Cabot Oil & Gas Corp | Energy - Fossil Fuels | 41.67 |
| Cadence Design Systems Inc | Software & IT Services | 40.96 |
| Cameron International Corp | Energy - Fossil Fuels | 66.18 |
| Campbell Soup Co | Food & Beverages | 79.88 |
| Capital One Financial Corp | Banking & Investment Services | 69.68 |
| Capri Holdings Ltd | Retailers | 46.32 |
| Cardinal Health Inc | Food & Drug Retailing | 57.18 |
| Carefusion Corp | Healthcare Services & Equipment | 46.77 |
| Carmax Inc | Retailers | 52.06 |
| Carnival Corp | Cyclical Consumer Services | 71.63 |
| Cars.com Inc | Software & IT Services | 49.84 |
| Caterpillar Inc | Industrial Goods | 79.58 |
| Cboe Global Markets Inc | Banking & Investment Services | 42.44 |
| CBRE Group Inc | Real Estate | 85.76 |
| CBS Corp | Cyclical Consumer Services | 59.56 |
| CDW Corp | Software & IT Services | 63.25 |
| Celanese Corp | Chemicals | 57.05 |
| Celgene Corp | Pharma & Medical Research | 60.79 |
| Centene Corp | Healthcare Services & Equipment | 49.90 |
| CenterPoint Energy Inc | Utilities | 44.27 |
| Centurylink Inc | Telecommunications Services | 64.35 |
| Cephalon Inc | Applied Resources | 66.63 |
| Cerner Corp | Healthcare Services & Equipment | 41.64 |
| CF Industries Holdings Inc | Chemicals | 41.09 |
| Charles Schwab Corp | Banking & Investment Services | 50.42 |
| Charter Communications Inc | Cyclical Consumer Services | 33.75 |
| Chesapeake Energy Corp | Energy - Fossil Fuels | 59.84 |
| Chevron Corp | Energy - Fossil Fuels | 86.31 |
| Chipotle Mexican Grill Inc | Cyclical Consumer Services | 45.36 |
| Chubb Corp | Insurance | 64.65 |
| Chubb Ltd | Insurance | 62.00 |
| Church & Dwight Co Inc | Personal & Household Prod. & Serv. | 58.50 |
| Cigna Corp | Healthcare Services & Equipment | 72.63 |
| Cimarex Energy Co | Energy - Fossil Fuels | 31.48 |
| Cincinnati Financial Corp | Insurance | 47.41 |
| Cintas Corp | Industrial & Commercial Services | 70.60 |
| Cisco Systems Inc | Technology Equipment | 88.00 |
| Citigroup Inc | Banking & Investment Services | 81.87 |
| Citizens Financial Group Inc | Banking & Investment Services | 52.97 |
| Citrix Systems Inc | Software & IT Services | 60.64 |
| Cleveland-Cliffs Inc | Mineral Resources | 70.65 |
| Clorox Co | Personal & Household Prod. & Serv. | 81.30 |
| CME Group Inc | Banking & Investment Services | 52.07 |
| CMS Energy Corp | Utilities | 58.47 |
| CNX Resources Corp | Energy - Fossil Fuels | 60.27 |
| Coca-Cola Co | Food & Beverages | 76.60 |
| Coca-Cola European Partners PLC | Food & Beverages | 68.83 |
| Cognizant Technology Solutions Corp | Software & IT Services | 69.31 |
| Colgate-Palmolive Co | Personal & Household Prod. & Serv. | 82.45 |
| Columbia Pipeline Group Inc | Energy - Fossil Fuels | 27.82 |
| Comcast Corp | Cyclical Consumer Services | 62.61 |
| Comerica Inc | Banking & Investment Services | 74.93 |
| Compuware Corp | Software & IT Services | 54.71 |
| Conagra Brands Inc | Food & Beverages | 76.04 |
| Concho Resources Inc | Energy - Fossil Fuels | 36.93 |
| Conduent Inc | Software & IT Services | 61.91 |
| ConocoPhillips | Energy - Fossil Fuels | 85.97 |
| Consolidated Edison Inc | Utilities | 77.12 |
| Constellation Brands Inc | Food & Beverages | 46.50 |
| Constellation Energy Group Inc | Utilities | 82.94 |
| Cooper Companies Inc | Healthcare Services & Equipment | 36.17 |
| Cooper Industries Unlimited Co | Industrial Goods | 60.73 |

| | | |
|---|---|---|
| Copart Inc | Retailers | 31.81 |
| Corning Inc | Technology Equipment | 68.66 |
| Corteva Inc | Food & Beverages | N/A |
| Costco Wholesale Corp | Retailers | 66.06 |
| Coty Inc | Personal & Household Prod. & Serv. | 39.67 |
| Coventry Health Care Inc | Healthcare Services & Equipment | 45.84 |
| Covetrus Inc | Healthcare Services & Equipment | N/A |
| Covidien PLC | Healthcare Services & Equipment | 59.48 |
| Crown Castle International Corp | Real Estate | 36.23 |
| CSRA Inc | Software & IT Services | 46.92 |
| CSX Corp | Transportation | 72.97 |
| Cummins Inc | Automobiles & Auto Parts | 77.13 |
| CVS Health Corp | Healthcare Services & Equipment | 88.13 |
| D.R. Horton Inc | Cyclical Consumer Products | 44.49 |
| Danaher Corp | Healthcare Services & Equipment | 55.14 |
| Darden Restaurants Inc | Cyclical Consumer Services | 59.03 |
| DaVita Inc | Healthcare Services & Equipment | 66.12 |
| Dean Foods Co | Food & Beverages | 63.89 |
| Deere & Co | Industrial Goods | 71.77 |
| Dell Inc | Technology Equipment | 68.09 |
| Dell Technologies Inc | Technology Equipment | 42.26 |
| Delphi Technologies PLC | Automobiles & Auto Parts | 43.72 |
| Delta Air Lines Inc | Transportation | 68.33 |
| Denbury Resources Inc | Energy - Fossil Fuels | 67.62 |
| Dentsply Sirona Inc | Healthcare Services & Equipment | 44.65 |
| Devon Energy Corp | Energy - Fossil Fuels | 59.80 |
| Diamond Offshore Drilling Inc | Energy - Fossil Fuels | 41.11 |
| Diamondback Energy Inc | Energy - Fossil Fuels | 36.64 |
| Digital Realty Trust Inc | Real Estate | 53.55 |
| DIRECTV | Cyclical Consumer Services | 66.49 |
| Discover Financial Services | Banking & Investment Services | 63.92 |
| Discovery Inc | Cyclical Consumer Services | 51.08 |
| DISH Network Corp | Cyclical Consumer Services | 25.36 |
| Dollar General Corp | Retailers | 41.18 |
| Dollar Tree Inc | Retailers | 47.71 |
| Dominion Energy Inc | Utilities | 69.86 |
| Dominion Energy Questar Corp | Utilities | 70.28 |
| Dow Chemical Co | Chemicals | 78.87 |
| Dow Inc | Chemicals | N/A |
| Dover Corp | Industrial Goods | 57.24 |
| DTE Energy Co | Utilities | 69.60 |
| Duke Energy Corp | Utilities | 71.15 |
| Duke Realty Corp | Real Estate | 56.07 |
| Dun & Bradstreet Corp | Industrial & Commercial Services | 53.43 |
| Dupont De Nemours Inc | Chemicals | N/A |
| DXC Technology Co | Software & IT Services | 64.74 |
| E I du Pont de Nemours and Co | Industrial Conglomerates | 84.10 |
| E*TRADE Financial Corp | Banking & Investment Services | 34.26 |
| Eastman Chemical Co | Chemicals | 67.87 |
| Eastman Kodak Co | Technology Equipment | 55.86 |
| Eaton Corporation PLC | Industrial Goods | 73.82 |
| eBay Inc | Software & IT Services | 64.64 |
| Ecolab Inc | Chemicals | 72.58 |
| Edison International | Utilities | 51.03 |
| Edwards Lifesciences Corp | Healthcare Services & Equipment | 57.60 |
| El Paso LLC | Energy - Fossil Fuels | 71.17 |
| Electronic Arts Inc | Software & IT Services | 57.99 |
| Eli Lilly and Co | Pharma & Medical Research | 78.24 |
| EMC Corp | Technology Equipment | 70.59 |
| EMD Millipore Corp | Pharma & Medical Research | N/A |
| Emerson Electric Co | Industrial Goods | 59.41 |
| Endo International PLC | Pharma & Medical Research | 37.80 |
| Entergy Corp | Utilities | 74.51 |
| Envision Healthcare Corp | Healthcare Services & Equipment | 38.55 |
| Envision Healthcare Holdings Inc | Healthcare Services & Equipment | 37.56 |
| EOG Resources Inc | Energy - Fossil Fuels | 57.05 |
| EQT Corp | Energy - Fossil Fuels | 58.83 |
| Equifax Inc | Industrial & Commercial Services | 41.14 |
| Equinix Inc | Real Estate | 60.72 |
| Equity Residential | Real Estate | 61.54 |

| Company | Sector | Value | Company | Sector | Value |
|---|---|---|---|---|---|
| Essex Property Trust Inc | Real Estate | 40.34 | HCP Inc | Real Estate | 74.03 |
| Estee Lauder Companies Inc | Personal & Household Prod. & Serv. | 68.22 | Helmerich and Payne Inc | Energy - Fossil Fuels | 27.57 |
| Everest Re Group Ltd | Insurance | 40.13 | Henry Schein Inc | Healthcare Services & Equipment | 57.37 |
| Evergy Inc | Utilities | 35.14 | Hershey Co | Food & Beverages | 73.10 |
| Eversource Energy | Utilities | 68.20 | Hess Corp | Energy - Fossil Fuels | 71.74 |
| Exelon Corp | Utilities | 73.50 | Hewlett Packard Enterprise Co | Technology Equipment | 77.53 |
| Expedia Group Inc | Cyclical Consumer Services | 25.74 | Hillshire Brands Co | Food & Beverages | 77.95 |
| Expeditors International of Washingto | Transportation | 53.46 | Hilton Worldwide Holdings Inc | Cyclical Consumer Services | 69.25 |
| Express Scripts Holding Co | Food & Drug Retailing | 44.21 | HollyFrontier Corp | Energy - Fossil Fuels | 45.56 |
| Extra Space Storage Inc | Real Estate | 21.40 | Hologic Inc | Healthcare Services & Equipment | 48.09 |
| Exxon Mobil Corp | Energy - Fossil Fuels | 81.17 | Home Depot Inc | Retailers | 81.03 |
| F5 Networks Inc | Software & IT Services | 52.66 | Honeywell International Inc | Industrial Conglomerates | 72.22 |
| Facebook Inc | Software & IT Services | 50.04 | Hormel Foods Corp | Food & Beverages | 64.08 |
| Family Dollar Stores Inc | Retailers | 57.69 | Hospira Inc | Pharma & Medical Research | 69.66 |
| Fastenal Co | Industrial Goods | 33.33 | Host Hotels & Resorts Inc | Real Estate | 73.74 |
| Federal Realty Investment Trust | Real Estate | 57.12 | HP Inc | Technology Equipment | 79.97 |
| Federated Investors Inc | Banking & Investment Services | 27.39 | Hudson City Bancorp Inc | Banking & Investment Services | 26.63 |
| FedEx Corp | Transportation | 77.17 | Humana Inc | Healthcare Services & Equipment | 75.60 |
| Fidelity National Information Services | Banking & Investment Services | 39.23 | Huntington Bancshares Inc | Banking & Investment Services | 53.34 |
| Fifth Third Bancorp | Banking & Investment Services | 65.14 | Huntington Ingalls Industries Inc | Industrial Goods | 39.93 |
| First Horizon National Corp | Banking & Investment Services | 54.11 | IDEX Corp | Industrial Goods | 45.55 |
| First Republic Bank | Banking & Investment Services | 45.72 | IDEXX Laboratories Inc | Healthcare Services & Equipment | 30.98 |
| First Solar Inc | Renewable Energy | 54.55 | IHS Markit Ltd | Industrial & Commercial Services | 55.67 |
| FirstEnergy Corp | Utilities | 58.81 | ILG Llc | Cyclical Consumer Services | 26.27 |
| Fiserv Inc | Industrial & Commercial Services | 31.10 | Illinois Tool Works Inc | Industrial Conglomerates | 52.29 |
| Fleetcor Technologies Inc | Industrial & Commercial Services | 27.65 | Illumina Inc | Healthcare Services & Equipment | 39.88 |
| FLIR Systems Inc | Technology Equipment | 30.32 | Incyte Corp | Pharma & Medical Research | 60.96 |
| Flowserve Corp | Industrial Goods | 63.19 | Ingersoll-Rand PLC | Industrial Goods | 70.00 |
| Fluor Corp | Industrial & Commercial Services | 75.08 | Ingevity Corp | Chemicals | 32.47 |
| FMC Corp | Chemicals | 59.43 | Intel Corp | Technology Equipment | 92.26 |
| FMC Technologies Inc | Energy - Fossil Fuels | 40.35 | Intercontinental Exchange Inc | Banking & Investment Services | 48.90 |
| Foot Locker Inc | Retailers | 37.79 | International Business Machines Corp | Software & IT Services | 85.38 |
| Ford Motor Co | Automobiles & Auto Parts | 69.00 | International Flavors & Fragrances Inc | Food & Beverages | 73.88 |
| Forest Laboratories Inc | Pharma & Medical Research | 35.70 | International Game Technology | Cyclical Consumer Services | N/A |
| Fortinet Inc | Software & IT Services | 47.70 | International Paper Co | Applied Resources | 72.56 |
| Fortive Corp | Industrial Goods | 31.67 | Interpublic Group of Companies Inc | Cyclical Consumer Services | 69.07 |
| Fortune Brands Home & Security Inc | Cyclical Consumer Products | 45.60 | Intuit Inc | Software & IT Services | 83.28 |
| Fossil Group Inc | Cyclical Consumer Products | 32.63 | Intuitive Surgical Inc | Healthcare Services & Equipment | 47.52 |
| Four Corners Property Trust Inc | Real Estate | 38.88 | Invesco Ltd | Banking & Investment Services | 64.87 |
| Fox Corp | Cyclical Consumer Services | N/A | IPG Photonics Corp | Technology Equipment | 32.36 |
| Franklin Resources Inc | Banking & Investment Services | 64.91 | IQVIA Holdings Inc | Pharma & Medical Research | 64.00 |
| Freeport-McMoRan Inc | Mineral Resources | 74.12 | Iqvia Inc | Pharma & Medical Research | N/A |
| Frontier Communications Corp | Telecommunications Services | 55.63 | Iron Mountain Inc | Real Estate | 58.30 |
| GameStop Corp | Retailers | 47.30 | ITT Inc | Industrial Goods | 68.30 |
| Gap Inc | Retailers | 89.04 | J B Hunt Transport Services Inc | Transportation | 50.67 |
| Garmin Ltd | Industrial Goods | 53.96 | J C Penney Company Inc | Retailers | 73.25 |
| Garrett Motion Inc | Automobiles & Auto Parts | 45.60 | J M Smucker Co | Food & Beverages | 55.65 |
| Gartner Inc | Software & IT Services | 45.54 | Jabil Inc | Technology Equipment | 60.91 |
| General Dynamics Corp | Industrial Goods | 66.60 | Jack Henry & Associates Inc | Software & IT Services | 31.77 |
| General Electric Co | Industrial Conglomerates | 88.84 | Jacobs Engineering Group Inc | Industrial & Commercial Services | 61.09 |
| General Mills Inc | Food & Beverages | 81.52 | Janus Capital Group Inc | Banking & Investment Services | 53.58 |
| General Motors Co | Automobiles & Auto Parts | 63.49 | JBG SMITH Properties | Real Estate | 64.70 |
| Genuine Parts Co | Automobiles & Auto Parts | 30.62 | Jefferies Financial Group Inc | Investment Holding Companies | 41.80 |
| Genworth Financial Inc | Insurance | 51.18 | Johnson & Johnson | Pharma & Medical Research | 87.27 |
| Genzyme Corp | Pharma & Medical Research | N/A | Johnson Controls Inc | Automobiles & Auto Parts | N/A |
| Gilead Sciences Inc | Pharma & Medical Research | 73.44 | Johnson Controls International PLC | Industrial Goods | 85.67 |
| Global Payments Inc | Industrial & Commercial Services | 26.74 | JPMorgan Chase & Co | Banking & Investment Services | 80.91 |
| Globe Life Inc | Insurance | 36.01 | Juniper Networks Inc | Technology Equipment | 67.66 |
| Goldman Sachs Group Inc | Banking & Investment Services | 70.51 | Kansas City Southern | Transportation | 51.23 |
| Goodrich Corp | Industrial Goods | 56.81 | Kellogg Co | Food & Beverages | 67.12 |
| Goodyear Tire & Rubber Co | Automobiles & Auto Parts | 55.59 | Keurig Dr Pepper Inc | Food & Beverages | 66.51 |
| Graham Holdings Co | Personal & Household Prod. & Serv. | 37.50 | Keurig Green Mountain Inc | Food & Beverages | 72.82 |
| H & R Block Inc | Personal & Household Prod. & Serv. | 42.40 | KeyCorp | Banking & Investment Services | 74.58 |
| Halliburton Co | Energy - Fossil Fuels | 79.36 | Keysight Technologies Inc | Industrial Goods | 74.09 |
| HanesBrands Inc | Cyclical Consumer Products | 66.57 | Kimberly-Clark Corp | Personal & Household Prod. & Serv. | 67.54 |
| Harley-Davidson Inc | Automobiles & Auto Parts | 45.57 | Kimco Realty Corp | Real Estate | 68.01 |
| Harman International Industries Inc | Automobiles & Auto Parts | 48.33 | Kinder Morgan Inc | Energy - Fossil Fuels | 37.16 |
| Hartford Financial Services Group Inc | Insurance | 76.41 | King Pharmaceuticals LLC | Pharma & Medical Research | N/A |
| Hasbro Inc | Cyclical Consumer Products | 79.88 | KLA Corp | Technology Equipment | 54.62 |
| HCA Healthcare Inc | Healthcare Services & Equipment | 49.83 | Kohls Corp | Retailers | 77.28 |

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|---|---|---|---|---|---|
| Komatsu Mining Corp | Mineral Resources | 49.97 | Morgan Stanley | Banking & Investment Services | 76.97 |
| Kontoor Brands Inc | Cyclical Consumer Products | N/A | Mosaic Co | Chemicals | 63.85 |
| Kraft Foods Group Inc | Food & Beverages | 39.64 | Motorola Mobility Holdings LLC | Technology Equipment | N/A |
| Kraft Heinz Co | Food & Beverages | 65.35 | Motorola Solutions Inc | Technology Equipment | 82.62 |
| Kraft Heinz Foods Co | Food & Beverages | 74.67 | MSCI Inc | Industrial & Commercial Services | 39.99 |
| Kroger Co | Food & Drug Retailing | 73.12 | Murphy Oil Corp | Energy - Fossil Fuels | 54.81 |
| L Brands Inc | Retailers | 67.59 | Mylan NV | Pharma & Medical Research | 47.87 |
| L3 Technologies Inc | Industrial Goods | 21.02 | Nabors Industries Ltd | Energy - Fossil Fuels | 46.33 |
| L3Harris Technologies Inc | Industrial Goods | 55.49 | Nasdaq Inc | Banking & Investment Services | 53.41 |
| Laboratory Corporation of America Ho | Healthcare Services & Equipment | 61.34 | National Oilwell Varco Inc | Energy - Fossil Fuels | 68.76 |
| Lam Research Corp | Technology Equipment | 58.33 | National Semiconductor Corp | Technology Equipment | 74.49 |
| Lamb Weston Holdings Inc | Food & Beverages | 41.59 | Navient Corp | Banking & Investment Services | 41.58 |
| Las Vegas Sands Corp | Cyclical Consumer Services | 54.65 | Nektar Therapeutics | Pharma & Medical Research | 43.67 |
| Legg Mason Inc | Banking & Investment Services | 67.51 | NetApp Inc | Technology Equipment | 46.27 |
| Leggett & Platt Inc | Cyclical Consumer Products | 48.34 | Netflix Inc | Software & IT Services | 29.34 |
| Leidos Holdings Inc | Software & IT Services | 78.68 | New York Times Co | Cyclical Consumer Services | 53.21 |
| Lennar Corp | Cyclical Consumer Products | 34.08 | Newell Brands Inc | Cyclical Consumer Products | 60.29 |
| Level 3 Parent LLC | Telecommunications Services | N/A | Newfield Exploration Co | Energy - Fossil Fuels | 57.61 |
| Lexmark International Inc | Technology Equipment | 75.38 | Newmont Goldcorp Corp | Mineral Resources | 81.49 |
| Life Technologies Corp | Pharma & Medical Research | 78.38 | News Corp | Cyclical Consumer Services | 41.90 |
| Lincoln National Corp | Insurance | 67.61 | Nextera Energy Inc | Utilities | 67.77 |
| Linde PLC | Chemicals | 84.29 | Nicor Inc | Utilities | 51.17 |
| Linear Technology Corp | Technology Equipment | 33.78 | Nielsen Holdings PLC | Cyclical Consumer Services | 53.53 |
| LKQ Corp | Automobiles & Auto Parts | 28.00 | Nike Inc | Cyclical Consumer Products | 71.91 |
| Lockheed Martin Corp | Industrial Goods | 76.69 | NiSource Inc | Utilities | 69.26 |
| Loews Corp | Insurance | 37.21 | Noble Corporation PLC | Energy - Fossil Fuels | 41.25 |
| Lorillard LLC | Food & Beverages | 23.53 | Noble Energy Inc | Energy - Fossil Fuels | 59.88 |
| Lowe's Companies Inc | Retailers | 79.11 | Nordstrom Inc | Retailers | 79.00 |
| LSI Corp | Technology Equipment | 76.50 | Norfolk Southern Corp | Transportation | 72.42 |
| LyondellBasell Industries NV | Chemicals | 60.76 | Northern Trust Corp | Banking & Investment Services | 76.28 |
| M&T Bank Corp | Banking & Investment Services | 43.50 | Northrop Grumman Corp | Industrial Goods | 75.60 |
| Macerich Co | Real Estate | 64.07 | Norwegian Cruise Line Holdings Ltd | Cyclical Consumer Services | 40.22 |
| Macy's Inc | Retailers | 69.59 | Novellus Systems Inc | Technology Equipment | 52.99 |
| Mallinckrodt Plc | Pharma & Medical Research | 58.36 | NRG Energy Inc | Utilities | 64.75 |
| Marathon Oil Corp | Energy - Fossil Fuels | 79.22 | Nucor Corp | Mineral Resources | 58.66 |
| Marathon Petroleum Corp | Energy - Fossil Fuels | 71.63 | nVent Electric PLC | Industrial Goods | 44.10 |
| Marketaxess Holdings Inc | Banking & Investment Services | 47.90 | NVIDIA Corp | Technology Equipment | 80.23 |
| Marriott International Inc | Cyclical Consumer Services | 72.67 | NVR Inc | Cyclical Consumer Products | 34.80 |
| Marsh & McLennan Companies Inc | Insurance | 60.02 | NYSE Euronext | Banking & Investment Services | 66.34 |
| Marshall & Ilsley Corp | Banking & Investment Services | N/A | Occidental Petroleum Corp | Energy - Fossil Fuels | 75.27 |
| Martin Marietta Materials Inc | Mineral Resources | 43.03 | Office Depot Inc | Retailers | 72.33 |
| Masco Corp | Cyclical Consumer Products | 64.48 | Omnicom Group Inc | Cyclical Consumer Services | 60.67 |
| Mastercard Inc | Software & IT Services | 66.04 | ONEOK Inc | Energy - Fossil Fuels | 65.34 |
| Mattel Inc | Cyclical Consumer Products | 69.18 | Oracle America Inc | Software & IT Services | N/A |
| Maxim Integrated Products Inc | Technology Equipment | 58.92 | Oracle Corp | Software & IT Services | 73.97 |
| McAfee LLC | Software & IT Services | N/A | O'Reilly Automotive Inc | Retailers | 43.09 |
| McCormick & Company Inc | Food & Beverages | 57.49 | Owens-Illinois Inc | Applied Resources | 43.24 |
| Mcdonald's Corp | Cyclical Consumer Services | 74.66 | Paccar Inc | Industrial Goods | 54.03 |
| McKesson Corp | Food & Drug Retailing | 70.43 | Packaging Corp of America | Applied Resources | 46.73 |
| Mead Johnson Nutrition Co | Food & Beverages | 61.76 | Pactiv LLC | Applied Resources | N/A |
| Medco Health Solutions Inc | Food & Drug Retailing | 76.80 | Pall Corp | Industrial Goods | 70.12 |
| Medtronic PLC | Healthcare Services & Equipment | 76.44 | Parker-Hannifin Corp | Industrial Goods | 56.37 |
| Merck & Co Inc | Pharma & Medical Research | 76.16 | Patterson Companies Inc | Healthcare Services & Equipment | 45.68 |
| Meredith Corp | Cyclical Consumer Services | 72.16 | Paychex Inc | Industrial & Commercial Services | 45.38 |
| MetLife Inc | Insurance | 69.52 | PayPal Holdings Inc | Software & IT Services | 62.10 |
| Mettler-Toledo International Inc | Industrial Goods | 60.33 | Peabody Energy Corp | Energy - Fossil Fuels | 73.18 |
| MGM Resorts International | Cyclical Consumer Services | 64.53 | Pentair PLC | Industrial Goods | 54.82 |
| Micro Focus Software Inc | Software & IT Services | 65.86 | People's United Financial Inc | Banking & Investment Services | 40.90 |
| Microchip Technology Inc | Technology Equipment | 58.96 | Pepco Holdings LLC | Utilities | 64.44 |
| Micron Technology Inc | Technology Equipment | 58.83 | Pepsi Bottling Group Inc | Food & Beverages | N/A |
| Microsoft Corp | Software & IT Services | 92.28 | PepsiCo Inc | Food & Beverages | 85.10 |
| Mid-America Apartment Communities | Real Estate | 45.43 | PerkinElmer Inc | Healthcare Services & Equipment | 66.47 |
| Mohawk Industries Inc | Cyclical Consumer Products | 62.56 | Perrigo Company PLC | Pharma & Medical Research | 53.18 |
| Molex LLC | Industrial Goods | 47.58 | Perspecta Inc | Software & IT Services | 54.43 |
| Molson Coors Brewing Co | Food & Beverages | 66.19 | PetSmart Inc | Retailers | 55.71 |
| Mondelez International Inc | Food & Beverages | 84.38 | Pfizer Inc | Pharma & Medical Research | 76.61 |
| Monsanto Co | Chemicals | 61.47 | PG&E Corp | Utilities | 81.65 |
| Monster Beverage Corp | Food & Beverages | 24.17 | Philip Morris International Inc | Food & Beverages | 67.49 |
| Monster Worldwide Inc | Industrial & Commercial Services | 27.77 | Phillips 66 | Energy - Fossil Fuels | 72.17 |
| Moody's Corp | Industrial & Commercial Services | 65.31 | Pinnacle West Capital Corp | Utilities | 71.21 |

| Company | Sector | Score | Company | Sector | Score |
|---|---|---|---|---|---|
| Pioneer Natural Resources Co | Energy - Fossil Fuels | 46.10 | Snap-On Inc | Industrial Goods | 59.41 |
| Pitney Bowes Inc | Technology Equipment | 58.23 | Southern Co | Utilities | 65.36 |
| Plum Creek Timber Company Inc | Real Estate | 71.75 | Southern Company Gas | Utilities | 56.31 |
| PNC Financial Services Group Inc | Banking & Investment Services | 79.33 | Southwest Airlines Co | Transportation | 72.01 |
| PPG Industries Inc | Chemicals | 70.79 | Southwestern Energy Co | Energy - Fossil Fuels | 62.07 |
| PPL Corp | Utilities | 62.17 | Spectra Energy Corp | Energy - Fossil Fuels | 73.77 |
| Praxair Inc | Chemicals | N/A | Sprint Communications Inc | Telecommunications Services | 72.96 |
| Precision Castparts Corp | Industrial Goods | 36.52 | St Jude Medical Inc | Healthcare Services & Equipment | 56.62 |
| Principal Financial Group Inc | Insurance | 67.51 | Stanley Black & Decker Inc | Industrial Goods | 58.90 |
| Procter & Gamble Co | Personal & Household Prod. & Serv. | 76.32 | Staples Inc | Retailers | 84.20 |
| Progress Energy Inc | Utilities | 68.38 | Starbucks Corp | Cyclical Consumer Services | 82.67 |
| Progressive Corp | Insurance | 63.75 | Starwood Hotels & Resorts Worldwide L | Cyclical Consumer Services | N/A |
| Prologis Inc | Real Estate | 83.04 | State Street Corp | Banking & Investment Services | 84.10 |
| Prudential Financial Inc | Insurance | 80.70 | Stericycle Inc | Industrial & Commercial Services | 53.66 |
| Public Service Enterprise Group Inc | Utilities | 77.02 | Stryker Corp | Healthcare Services & Equipment | 59.39 |
| Public Storage | Real Estate | 45.72 | Sunedison Inc | Renewable Energy | 59.18 |
| PulteGroup Inc | Cyclical Consumer Products | 52.73 | Sunoco Inc | Energy - Fossil Fuels | 76.38 |
| PVH Corp | Cyclical Consumer Products | 68.85 | SunTrust Banks Inc | Banking & Investment Services | 52.11 |
| QEP Resources Inc | Energy - Fossil Fuels | 49.94 | SUPERVALU Inc | Food & Drug Retailing | 53.12 |
| Qlogic LLC | Technology Equipment | 31.03 | SVB Financial Group | Banking & Investment Services | 55.94 |
| Qorvo Inc | Technology Equipment | 43.41 | Symantec Corp | Software & IT Services | 83.16 |
| Qualcomm Inc | Technology Equipment | 71.62 | Synchrony Financial | Banking & Investment Services | 49.65 |
| Quality Care Properties Inc | Real Estate | 38.99 | Synopsys Inc | Software & IT Services | 50.36 |
| Quanta Services Inc | Industrial & Commercial Services | 35.82 | Sysco Corp | Food & Drug Retailing | 70.85 |
| Quest Diagnostics Inc | Healthcare Services & Equipment | 61.01 | T. Rowe Price Group Inc | Banking & Investment Services | 56.75 |
| Qwest Communications International | Telecommunications Services | 64.75 | Take-Two Interactive Software Inc | Cyclical Consumer Products | 40.81 |
| Ralph Lauren Corp | Cyclical Consumer Products | 45.10 | Tapestry Inc | Retailers | 59.02 |
| Range Resources Corp | Energy - Fossil Fuels | 60.69 | Target Corp | Retailers | 83.14 |
| Raymond James Financial Inc | Banking & Investment Services | 44.19 | TE Connectivity Ltd | Industrial Goods | 70.50 |
| Raytheon Co | Industrial Goods | 76.19 | TechnipFMC PLC | Energy - Fossil Fuels | 46.30 |
| Realty Income Corp | Real Estate | 57.46 | TECO Energy Inc | Utilities | 54.92 |
| Red Hat Inc | Software & IT Services | 46.43 | Tegna Inc | Cyclical Consumer Services | 59.17 |
| Regency Centers Corp | Real Estate | 67.06 | Teleflex Inc | Healthcare Services & Equipment | 42.58 |
| Regeneron Pharmaceuticals Inc | Pharma & Medical Research | 55.16 | Tellabs Inc | Technology Equipment | 52.29 |
| Regions Financial Corp | Banking & Investment Services | 54.20 | Tenet Healthcare Corp | Healthcare Services & Equipment | 74.62 |
| Republic Services Inc | Industrial & Commercial Services | 56.41 | Teradata Corp | Software & IT Services | 80.21 |
| Resideo Technologies Inc | Industrial Goods | N/A | Teradyne Inc | Technology Equipment | 59.21 |
| Resmed Inc | Healthcare Services & Equipment | 58.52 | Texas Instruments Inc | Technology Equipment | 91.48 |
| Reynolds American Inc | Food & Beverages | 53.58 | Textron Inc | Industrial Goods | 65.76 |
| Robert Half International Inc | Industrial & Commercial Services | 47.68 | Thermo Fisher Scientific Inc | Healthcare Services & Equipment | 75.06 |
| Rockwell Automation Inc | Industrial Goods | 66.30 | Tiffany & Co | Retailers | 68.02 |
| Rockwell Collins Inc | Industrial Goods | 66.90 | Time Warner Cable Inc | Cyclical Consumer Services | 65.90 |
| Rollins Inc | Industrial & Commercial Services | 36.95 | Time Warner Inc | Cyclical Consumer Services | 78.16 |
| Roper Technologies Inc | Industrial Goods | 36.78 | Titanium Metals Corp | Mineral Resources | 34.90 |
| Ross Stores Inc | Retailers | 48.31 | TJX Companies Inc | Retailers | 75.30 |
| Rowan Companies PLC | Energy - Fossil Fuels | 40.68 | T-Mobile US Inc | Telecommunications Services | 37.90 |
| Royal Caribbean Cruises Ltd | Cyclical Consumer Services | 64.18 | Total System Services Inc | Software & IT Services | 58.24 |
| RR Donnelley & Sons Co | Industrial & Commercial Services | 73.41 | Tractor Supply Co | Retailers | 61.54 |
| RS Legacy Corp | Retailers | 59.16 | TransDigm Group Inc | Industrial Goods | 18.94 |
| Ryder System Inc | Transportation | 73.32 | Transocean Ltd | Energy - Fossil Fuels | 58.88 |
| S&P Global Inc | Industrial & Commercial Services | 72.28 | Travelers Companies Inc | Insurance | 57.37 |
| Safeway Inc | Food & Drug Retailing | 65.53 | TripAdvisor Inc | Cyclical Consumer Services | 22.88 |
| Salesforce.Com Inc | Software & IT Services | 66.91 | Twenty-First Century Fox Inc | Cyclical Consumer Services | 56.18 |
| Sandisk LLC | Technology Equipment | 46.34 | Twitter Inc | Software & IT Services | 36.78 |
| SBA Communications Corp | Real Estate | 40.99 | Tyson Foods Inc | Food & Beverages | 57.50 |
| SCANA Corp | Utilities | 47.84 | U.S. Bancorp | Banking & Investment Services | 67.94 |
| Schlumberger NV | Energy - Fossil Fuels | 75.99 | UDR Inc | Real Estate | 49.58 |
| Scripps Networks Interactive Inc | Cyclical Consumer Services | 49.88 | Ulta Beauty Inc | Retailers | 46.94 |
| Seagate Technology PLC | Technology Equipment | 56.85 | Under Armour Inc | Cyclical Consumer Products | 36.53 |
| Sealed Air Corp | Applied Resources | 52.13 | Union Pacific Corp | Transportation | 65.09 |
| Sears Holdings Corp | Retailers | 70.66 | United Airlines Holdings Inc | Transportation | 49.66 |
| Sempra Energy | Utilities | 75.78 | United Parcel Service Inc | Transportation | 71.63 |
| Sherwin-Williams Co | Chemicals | 65.18 | United Rentals Inc | Industrial & Commercial Services | 43.86 |
| Sigma-Aldrich Corp | Chemicals | 72.21 | United States Steel Corp | Mineral Resources | 54.33 |
| Signet Jewelers Ltd | Retailers | 71.36 | United Technologies Corp | Industrial Goods | 80.42 |
| Simon Property Group Inc | Real Estate | 55.95 | UnitedHealth Group Inc | Healthcare Services & Equipment | 74.78 |
| Skyworks Solutions Inc | Technology Equipment | 63.81 | Universal Health Services Inc | Healthcare Services & Equipment | 35.98 |
| SL Green Realty Corp | Real Estate | 61.96 | Unum Group | Insurance | 64.46 |
| SLM Corp | Banking & Investment Services | 41.13 | Urban Outfitters Inc | Retailers | 36.06 |
| Smith International Inc | Energy - Fossil Fuels | N/A | W W Grainger Inc | Industrial Goods | 66.73 |

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|---|---|---|---|---|---|---|
| Valaris PLC | Energy - Fossil Fuels | 53.20 | VF Corp | Cyclical Consumer Products | 64.23 |
| Valero Energy Corp | Energy - Fossil Fuels | 73.44 | Whirlpool Corp | Cyclical Consumer Products | 67.24 |
| Walgreens Boots Alliance Inc | Food & Drug Retailing | 66.29 | Whole Foods Market Inc | Food & Drug Retailing | 67.63 |
| Walmart Inc | Food & Drug Retailing | 79.48 | Viacom Inc | Cyclical Consumer Services | 61.32 |
| Walt Disney Co | Cyclical Consumer Services | 77.45 | Viavi Solutions Inc | Technology Equipment | 46.52 |
| Varex Imaging Corp | Healthcare Services & Equipment | 36.67 | Williams Companies Inc | Energy - Fossil Fuels | 61.71 |
| Varian Medical Systems Inc | Healthcare Services & Equipment | 61.75 | Willis Towers Watson PLC | Insurance | 44.28 |
| Waste Management Inc | Industrial & Commercial Services | 80.44 | Windstream Holdings Inc | Telecommunications Services | 32.89 |
| Waters Corp | Healthcare Services & Equipment | 68.28 | Visa Inc | Software & IT Services | 56.52 |
| Wec Acquisition Corp | Utilities | 59.15 | Vornado Realty Trust | Real Estate | 56.23 |
| WEC Energy Group Inc | Utilities | 75.83 | WPX Energy Inc | Energy - Fossil Fuels | 43.98 |
| WellCare Health Plans Inc | Healthcare Services & Equipment | 49.37 | Vulcan Materials Co | Mineral Resources | 59.48 |
| Wells Fargo & Co | Banking & Investment Services | 80.40 | Wyndham Destinations Inc | Cyclical Consumer Services | 68.39 |
| Welltower Inc | Real Estate | 62.80 | Wynn Resorts Ltd | Cyclical Consumer Services | 39.40 |
| Ventas Inc | Real Estate | 67.40 | Xcel Energy Inc | Utilities | 70.62 |
| Verisign Inc | Software & IT Services | 53.58 | Xerox Holdings Corp | Technology Equipment | 76.98 |
| Verisk Analytics Inc | Software & IT Services | 54.29 | Xilinx Inc | Technology Equipment | 59.04 |
| Verizon Communications Inc | Telecommunications Services | 78.78 | XL Group Ltd | Insurance | 54.88 |
| Versum Materials Inc | Chemicals | 48.32 | XTO Energy Inc | Energy - Fossil Fuels | N/A |
| Vertex Pharmaceuticals Inc | Pharma & Medical Research | 47.11 | Xylem Inc | Industrial Goods | 67.06 |
| Western Digital Corp | Technology Equipment | 55.67 | Yum China Holdings Inc | Cyclical Consumer Services | 53.84 |
| Western Union Co | Industrial & Commercial Services | 55.66 | Yum! Brands Inc | Cyclical Consumer Services | 66.31 |
| Westinghouse Air Brake Technologies | Industrial Goods | 37.58 | Zimmer Biomet Holdings Inc | Healthcare Services & Equipment | 69.49 |
| Westrock Co | Applied Resources | 44.20 | Zions Bancorporation NA | Banking & Investment Services | 36.65 |
| Westrock MWV LLC | Applied Resources | 64.29 | Zoetis Inc | Pharma & Medical Research | 55.49 |
| Weyerhaeuser Co | Real Estate | 84.07 | | | |